

Preliminary Staff Assessment

**CALIFORNIA  
ENERGY  
COMMISSION**

# **ROSEVILLE ENERGY PARK**

**Application For Certification (03-AFC-1)  
Placer County**

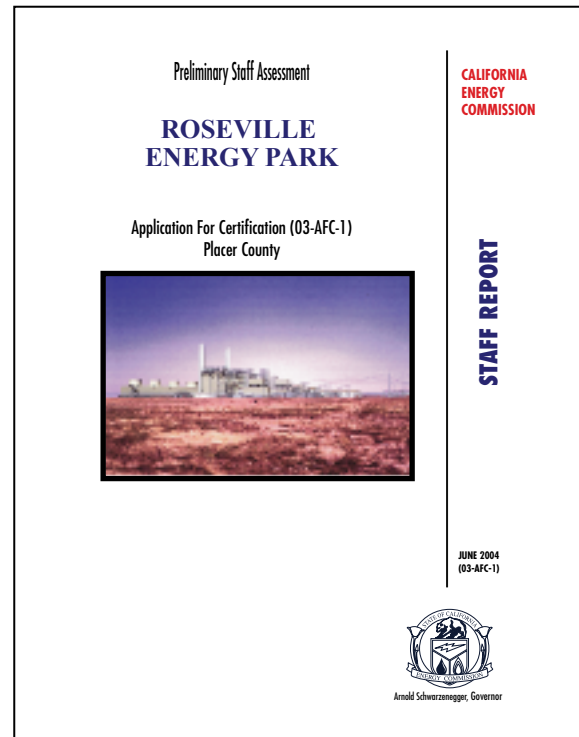


**STAFF REPORT**

**JUNE 2004  
(03-AFC-1)**



Arnold Schwarzenegger, Governor



# **CALIFORNIA ENERGY COMMISSION**

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# **EXECUTIVE SUMMARY**

## **INTRODUCTION**

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This Preliminary Staff Assessment (PSA) contains the California Energy Commission (Energy Commission) staff's independent analysis and preliminary recommendation on the Roseville Energy Park (REP or project). The REP and related facilities, such as the natural gas line, reclaimed and potable water supply lines are under the Energy Commission's jurisdiction. When issuing a license, the Energy Commission acts as lead state agency under the California Environmental Quality Act, and its process is functionally equivalent to the preparation of an environmental impact report. Sometime after a 30-day public comment period on the PSA, staff will issue its testimony in the form of the Final Staff Assessment (FSA).

The Energy Commission staff has the responsibility to complete an independent assessment of the project's potential effects on the environment, the public's health and safety, and whether the project conforms with all applicable laws, ordinances, regulations and standards (LORS). The staff also recommends measures to mitigate potential significant adverse environmental effects and conditions for construction, operation and eventual closure of the project, if approved by the Energy Commission.

This PSA is not the decision document for these proceedings nor does it contain findings of the Energy Commission related to environmental impacts or the project's compliance with local/state/federal legal requirements. The FSA will serve as staff's testimony in evidentiary hearings to be held by the Committee of two Commissioners who are hearing this case. The Committee will hold evidentiary hearings and will consider the recommendations presented by staff, the applicant, all parties, government agencies, and the public prior to proposing its decision. The Energy Commission will make the final decision, including findings, after the Committee's publication of its proposed decision.

## **PROJECT LOCATION AND DESCRIPTION**

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On October 30, 2003, The City of Roseville's electric department, doing business as Roseville Electric (RE) filed an Application for Certification (AFC), for its proposed Roseville Energy Park (REP) with the California Energy Commission seeking approval to construct and operate a 120 to 125 megawatt (MW) natural gas-fired, combined-cycle electric generating facility. As proposed, the REP will have the ability to peak-fire to 160 MW during summer design conditions and would be owned and operated by RE. The Commission found the project to be data adequate at its Business Meeting on December 17, 2003.

The proposed project would be located on a 12-acre site within a 40-acre City of Roseville parcel. The project site is within the limits of the City of Roseville, adjacent to and north of the Pleasant Grove Waste Water Treatment Plant (PGWWTP). The project site is owned by the City of Roseville and is zoned Public/Quasi-Public. Surrounding land uses currently include ranching (agricultural grazing) and rural residential. The project area to the south, east, and west, however, is proposed for

residential, industrial, and commercial development under the West Roseville Specific Plan (WRSP). The WRSP is a plan for annexation and development of 3,162 acres and was approved by the City of Roseville in February of 2004. Build-out of the WRSP would take place over approximately 10 years.

Natural gas for the project would be delivered by the Pacific Gas and Electric Company (PG&E) gas system via a new six-mile pipeline. A 60-kilovolt (kV) on-site switchyard would deliver the plant's power directly to the grid through a double-circuit 60 kV transmission line that would be located adjacent to the project site. This new line would be constructed along the current alignment of Phillip Road as part of the West Roseville development and would be looped directly through the project switchyard. A 50-foot-long pipeline would supply tertiary treated recycled waste water from the City of Roseville's adjacent PGWWTP for use as cooling tower makeup water, firewater, service water, and process makeup water.

The project is proposed to be operational in the summer of 2006.

A more complete description of the project is contained in the **PROJECT DESCRIPTION** section of this PSA.

## **PUBLIC AND AGENCY COORDINATION**

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The Energy Commission's REP Committee conducted an Informational Hearing and Site Visit on January 28, 2004. This hearing provided a forum for the public to learn about the project, the Energy Commission's process, ask questions, and voice their opinions regarding the proposed power plant.

When the AFC was filed, staff mailed a notice to all property owners adjacent to the proposed project informing them of the proposal, and the Energy Commission's review process. Staff's notice also informed the property owners of the methods available for participating in the Commission's review of the proposal.

Staff also coordinated their review of the REP with relevant local, state and federal agencies, such as the City of Roseville, Placer County, the California Independent System Operator, the Placer County Air Pollution Control District, the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the California Department of Fish and Game. This PSA provides agencies and the public the opportunity to review the Energy Commission staff's analysis of the proposed project.

Written comments on this PSA will be taken into consideration in preparing the Final Staff Assessment (FSA).

## **ENVIRONMENTAL JUSTICE**

EPA guidelines on environmental justice state that if 50 percent of the population affected by a project has minority or low-income status, it must be determined if these populations are exposed to disproportionately high and adverse human health or environmental impacts.



Staff has reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed REP power plant (please refer to **Socioeconomics Figure 1**). However, as indicated in **Socioeconomics Figure 1**, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius. Staff also reviewed Census 2000 information that shows the low-income population is less than fifty percent within the same radius. Because staff has determined there to be pockets or clusters of minority population within the six-mile radius, staff has incorporated environmental justice concerns in its analysis.

When a minority or low-income population is identified, staff in the technical areas of air quality, public health, hazardous materials, noise, water, waste, traffic and transportation, visual resources, land use, socioeconomics, and transmission line safety and nuisance must consider possible impacts on the minority/low-income population as part of their analysis. This environmental justice analysis consists of identification of significant impacts (if any), identification of mitigation, and determination of whether there is a disproportionate impact if an unmitigated significant impact has been identified.

With the exception of air quality and noise, staff has concluded that the project does not result in any significant unmitigated impacts to an environmental justice population. However, staff has determined that the potential noise impacts identified in our analysis do not impact minority or low-income populations. Therefore, staff has determined that there is no potential for a noise related environmental justice impact from the proposed project.

A complete analysis of the potential environmental justice impacts of the proposed project, including air quality, will be presented in the Final Staff Assessment.

## **STAFF'S ASSESSMENT**

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Each technical area section of the PSA contains a discussion of impacts, staff's preliminary conclusions and recommendations, and, where appropriate, mitigation measures and conditions of certification. The PSA includes staff's assessments of:

- the environmental setting of the proposal;
- impacts on public health and safety, and measures proposed to mitigate these impacts;
- environmental impacts, and measures proposed to mitigate these impacts;
- the engineering design of the proposed facility, and engineering measures proposed to ensure the project can be constructed and operated safely and reliably;
- project closure;
- project alternatives; and
- compliance of the project with all applicable laws, ordinances, regulations and standards (LORS) during construction and operation.

## OVERVIEW OF STAFF'S CONCLUSIONS

Staff's preliminary analysis indicates that, with the exception of Air Quality, Biological Resources, Cultural Resources, Noise, and Visual Resources, the project's environmental impacts can be mitigated to levels of less than significant, and that the project can be made to conform with all applicable LORS. Staff will present a complete analysis, and recommendation, in the Final Staff Assessment.

The following table summarizes the potential environmental impacts and LORS compliance for each technical area.

Technical Discipline	Environmental / System Impact	LORS Conformance
Air Quality	Inconclusive	Inconclusive
Biological Resources	Inconclusive	Inconclusive
Cultural Resources	Inconclusive	Inconclusive
Power Plant Efficiency	No Impact	N/A
Power Plant Reliability	No Impact	N/A
Facility Design	Impacts Mitigated	Yes
Geology	Impacts Mitigated	Yes
Hazardous Materials	Impacts Mitigated	Yes
Land Use	Impacts Mitigated	Yes
Noise	Inconclusive	Inconclusive
Public Health	Impacts Mitigated	Yes
Socioeconomics	No Impact	Yes
Traffic and Transportation	Impacts Mitigated	Yes
Transmission Line Safety	Impacts Mitigated	Yes
Transmission System Engineering	Impacts Mitigated	Yes
Visual Resources	Inconclusive	Inconclusive
Waste Management	Impacts Mitigated	Yes
Water and Soils	Impacts Mitigated	Yes
Worker Safety	Impacts Mitigated	Yes

### Air Quality

Staff has found that the REP operational emissions of NO<sub>x</sub> do not have the potential to cause a direct impact on the state or federal NO<sub>2</sub> ambient air quality standards or to act as a precursor to the downwind formation of secondary PM<sub>10</sub>/PM<sub>2.5</sub>. However, staff also finds that the REP operational emissions of NO<sub>x</sub> have the potential, if left unmitigated, to cause or contribute to an impact on the state and federal ambient air quality ozone standards as a precursor to the downwind formation of ozone. Therefore, staff concludes that the REP operational emissions of NO<sub>x</sub>, if left unmitigated, have the potential to cause a significant ambient air quality impact. RE will reduce emissions by providing ERCs for NO<sub>x</sub> emissions, and thus reduce the potential for ozone formation. However, the current amounts of offsets proposed are insufficient to mitigate the project NO<sub>x</sub> emissions, as proposed, to a level of insignificance. To comply with District Rule 502, RE must secure an additional 16.15 tons/year of NO<sub>x</sub> ERCs.

Staff has found that the REP operational emissions of SO<sub>x</sub> will not cause or contribute to a violation of any of the SO<sub>2</sub> state or federal ambient air quality standards. However, staff has found that the REP operational emissions of SO<sub>x</sub>, if left unmitigated, may contribute to the downwind formation of secondary PM<sub>10</sub>/PM<sub>2.5</sub> ambient air quality impacts. RE is not proposing to mitigate the REP operational SO<sub>x</sub> emission ambient air quality impacts, thus staff finds these ambient air quality impacts to be significant if left unmitigated.

Staff has found that the REP operational emissions of VOC may contribute to the downwind formation of ozone and thus cause or contribute to ongoing violations of the state and federal ozone ambient air quality standards. RE is not proposing to mitigate the REP operational VOC emission ambient air quality impacts, thus staff finds these ambient air quality impacts to be significant if left unmitigated.

RE is investigating further NO<sub>x</sub> offset sources within the local rail yard. If an adequate source of NO<sub>x</sub> offsets is developed from this emission source, staff is confident that sufficient SO<sub>x</sub> and VOC emission reductions will be developed to mitigate the REP Sox and VOC ambient air quality impacts to a level of insignificance.

Staff has found the REP operational PM<sub>10</sub>/PM<sub>2.5</sub> emissions, if left unmitigated, may contribute to existing PM<sub>10</sub>/PM<sub>2.5</sub> violations of the state PM<sub>10</sub> and PM<sub>2.5</sub> ambient air quality standards. RE has provided sufficient PM<sub>10</sub> ERCs to comply with District rules; however, staff finds that these ERCs are based primarily on reductions of fugitive dust (consisting of course, fine and ultra fine particles) and not combustion sources (primarily ultra fine particles only). Therefore, staff strongly recommends that PM<sub>10</sub> ERCs based on combustion source reductions be given preference. Alternatively the proposed ERCs could be divided into course (PM), fine (PM<sub>10</sub>) and ultra fine (PM<sub>2.5</sub>) fractions and the ultra fine portion only applied to the REP as emission reductions. This alternative would ultimately require RE seek further PM<sub>10</sub> offsets.

RE is proposing an ammonia slip limit of 10 ppm @ 15 percent O<sub>2</sub>. Staff has demonstrated in testimony that an ammonia slip limit of five ppm @ 15 percent O<sub>2</sub> would pose no significant financial or technical burden to RE. To reduce the likelihood of a significant impact from excessive ammonia slip, staff recommends that the REP ammonia slip be limited to no more than five ppm @ 15 percent O<sub>2</sub> averaged over three hours.

Finally, RE has not yet provided the cumulative impact assessment for air quality. In the Final Staff Assessment, staff will provide the results of the cumulative impact assessment as well as the environmental justice impact assessment. Given that the cumulative impact assessment is not complete, that there is a significant short fall of NO<sub>x</sub> ERCs for offsetting purposes, that this short fall is in non-compliance with District rules and that the VOC and SO<sub>x</sub> emissions remain unmitigated. Therefore air quality staff cannot recommend the Roseville Energy Park project for approval at this time.

## **Biological Resources**

RE has not submitted a complete wetland delineation that has been accepted by the U.S. Army Corps of Engineers (USACE). Until the USACE receives and verifies the

complete wetland delineation, RE cannot submit a 404 permit application, the USACE cannot begin consultation with the USFWS, and the timeline for the USFWS issuing a Biological Opinion (135 days from request for consultation) could affect the schedule for project licensing. In addition, staff has determined that the amount of mitigation needed to address potential project impacts is greater than the amount proposed by the applicant.

At the PSA workshop, staff will work with the USACE to determine the current status of the wetland delineation, and discuss with the applicant any differences in the amount of mitigation required to address the project's potential impacts to Biological Resources. Staff will present a complete Biological Resources assessment in our Final Staff Assessment.

## **Cultural Resources**

Ground disturbing activities could impact Native American cultural resource site CA-PLA-263. An additional cultural resource survey is needed to determine if CA-PLA-263 is within the impact area. Staff has informally requested that the applicant examine this area again. If CA-PLA-263 could be impacted by project activities, then the resources would have to be evaluated to determine if it meets the eligibility requirements for the CRHR. If a resource meets the eligibility requirements, then mitigation measures would be developed to reduce the impacts to less than significant. Staff will provide an analysis of the potential impacts to CA-PLA-263 in our Final Staff Assessment following the submittal of the survey by the applicant.

With the possible exception of CA-PLA-263, no cultural resource sites have been identified that will be impacted by the project. However, staff is continuing to contact interested Native American groups and individuals regarding resources that could be impacted by the project. If there is a resource that qualifies as a Native American sacred site, then mitigation measures would need to be developed to reduce the impacts to less than significant, if possible. This will be completed prior to the Final Staff Assessment.

## **NOISE**

At this time, Energy Commission staff cannot conclude that the REP can be built to comply with all applicable noise laws, ordinances, regulations and standards, and cause no significant adverse impacts under CEQA. In addition to the applicant's proposed mitigation measures, staff recommends that the applicant identify additional feasible noise mitigation measures that would allow the REP to comply with the Placer County Noise Ordinance and CEQA requirements. If such mitigation proves infeasible, the applicant could demonstrate this, and could request that the Energy Commission grant an override of the County Noise Ordinance.

## **Visual Resources**

With effective implementation of REP's proposed mitigation measures as described in the AFC and supplements thereto, and staff's proposed conditions of certification, the proposed REP project would cause less than significant direct and cumulative visual impacts.

Although staff has found the visual impacts of the project to be less than significant on existing viewers, staff is concerned about the impacts of the project structures and water vapor plumes on future viewers in the West Roseville area. Staff is proposing that the applicant plant landscaping along the REP property boundaries prior to operation of the project so that by the time the WRSP is built out, the trees would have grown to provide substantial screening of the project structures. At the PSA Workshop, Energy Commission staff would like to discuss with the City of Roseville planning staff whether they have concerns about the REP's visible plumes having a negative aesthetic impact on the WRSP. If the City planners are concerned, staff would like to discuss with Roseville Electric plume abatement options that would minimize the size and frequency of the plumes to achieve better compatibility with the future land uses.

Except for a few instances, staff can conclude that the project, as it is proposed in the AFC or as conditioned by staff, would be consistent with applicable visual resources-related LORS. There are a few instances where staff needs input from the City of Roseville to make a final determination of LORS conformance. The applicant stated in Data Response 42 that the City would be reviewing the REP and would submit a set of conditions of approval for the project for consideration by Energy Commission staff (CH2MHill 2004a). This information was expected in March 2004, but to date has not been received. Staff expects that the City will provide this information as part of their comments on this PSA. Staff is hopeful that this information, when received, will also address the project's consistency with the City's visual resources-related policies so the City's input can be incorporated into the FSA.

## **CONCLUSION AND RECOMMENDATIONS**

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With the exceptions noted above for Air Quality, Biological Resources, Cultural Resources, Noise, and Visual Resources, the project would comply with LORS and not cause any unmitigated adverse significant impacts to the environment, public health and safety, and the transmission system, provided the recommended conditions of certification are implemented. As noted above, staff needs additional information in the technical areas of Air Quality, Biological Resources, Cultural Resources, Noise and Visual Resources in order to complete an analysis of the potential impacts in these technical areas.

Staff will notice and conduct one or more workshops in July 2004, for the purpose of receiving public comment on this PSA, and to resolve any remaining issues prior to release of the Final Staff Assessment.

**ROSEVILL ENERGY PARK  
PRELIMINARY STAFF ASSESSMENT**

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# INTRODUCTION

Bob Eller

## PURPOSE OF THIS REPORT

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The Preliminary Staff Assessment (PSA) presents the California Energy Commission (Energy Commission) staff's independent analysis of the Roseville Electric Application for Certification (AFC). This PSA is a staff document. It is neither a Committee document, nor a draft decision. The PSA describes the following:

- the existing environmental setting;
- the proposed project;
- whether the facilities can be constructed and operated safely and reliably in accordance with applicable laws, ordinances, regulations and standards (LORS);
- the environmental consequences of the project including potential public health and safety impacts;
- cumulative analysis of the potential impacts of the project, along with potential impacts from other existing and known planned developments;
- mitigation measures proposed by the applicant, staff, interested agencies and intervenors that may lessen or eliminate potential impacts;
- the proposed conditions under which the project should be constructed and operated, if it is certified;
- project alternatives; and
- project closure requirements.

The analyses contained in this PSA are based upon information from: 1) the AFC; 2) subsequent submittals; 3) responses to data requests; 4) supplementary information from local and state agencies and interested individuals; 5) existing documents and publications; and 6) independent field studies and research. The analyses for most technical areas include discussions of proposed conditions of certification. Each proposed condition of certification is followed by a proposed means of "verification." The verification is not part of the proposed condition, but is the Energy Commission Compliance Unit's method of ensuring post-certification compliance with adopted requirements.

The Energy Commission staff's analyses were prepared in accordance with Public Resources Code section 25500 et seq. and Title 20, California Code of Regulation section 1701 et seq., and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.).

## **ORGANIZATION OF THE STAFF ASSESSMENT**

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The PSA contains an Executive Summary, Introduction, Project Description, and Project Alternatives. The environmental, engineering, and public health and safety analysis of the proposed project is contained in a discussion of 19 technical areas. Each technical area is addressed in a separate chapter. They include the following: air quality, public health, worker safety and fire protection, transmission line safety, hazardous material management, waste management, land use, traffic and transportation, noise, visual resources, cultural resources, socioeconomics, biological resources, soil and water resources, geological and paleontological resources, facility design, power plant reliability, power plant efficiency, and transmission system engineering. These chapters are followed by a discussion of facility closure, project construction and operation compliance monitoring plans, and a list of staff that assisted in preparing this report.

Each of the 19 technical area assessments includes a discussion of:

- laws, ordinances, regulations and standards (LORS);
- the regional and site-specific setting;
- project specific and cumulative impacts;
- mitigation measures;
- closure requirements;
- conclusions and recommendations; and
- conditions of certification for both construction and operation (if applicable).

## **ENERGY COMMISSION SITING PROCESS**

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The California Energy Commission has the exclusive authority to certify the construction and operation of thermal electric power plants 50 megawatts (MW) or larger. The Energy Commission certification is in lieu of any permit required by state, regional, or local agencies, and federal agencies to the extent permitted by federal law (Pub. Resources Code, §25500). The Energy Commission must review power plant AFCs to assess potential environmental and public health and safety impacts, potential measures to mitigate those impacts (Pub. Resources Code, §25519), and compliance with applicable governmental laws and standards (Pub. Resources Code, §25523 (d)).

The Energy Commission's siting regulations require staff to independently review the AFC and assess whether the list of environmental impacts it contains is complete, and whether additional or more effective mitigation measures are necessary, feasible and available (Cal. Code Regs., tit. 20, §§ 1742 and 1742.5(a)). Staff's independent review is presented in this report (Cal. Code Regs., tit. 20, §1742.5).

In addition, staff must assess the completeness and adequacy of the health and safety standards, and the reliability of power plant operations (Cal. Code Regs., tit. 20, §



1743(b)). Staff is required to coordinate with other agencies to ensure that applicable laws, ordinances, regulations and standards are met (Cal. Code Regs., tit. 20, § 1744(b)).

Staff conducts its environmental analysis in accordance with the requirements of the California Environmental Quality Act. No Environmental Impact Report (EIR) is required because the Energy Commission's site certification program has been certified by the Resources Agency (Pub. Resources Code, §21080.5 and Cal. Code Regs., tit. 14, §15251 (k)). The Energy Commission acts in the role of the CEQA lead agency and is subject to all other applicable portions of CEQA.

Staff typically prepares both a preliminary and final staff assessment. The Preliminary Staff Assessment (PSA) presents for the applicant, intervenors, agencies, other interested parties and members of the public, the staff's preliminary analysis, conclusions, and recommendations.

Staff uses the PSA to resolve issues between the parties and to narrow the scope of adjudicated issues in the evidentiary hearings. During the period between publishing the PSA and the Final Staff Assessment (FSA), staff will conduct one or more workshops in the project area (Roseville) to discuss their findings, proposed mitigation, and proposed compliance monitoring requirements. Based on the workshops and written comments, staff will refine their analysis, correct errors, and finalize conditions of certification to reflect areas where staff has reached agreement with the parties. This refined analysis, along with responses to written comments on the PSA, will be published in the FSA. The FSA serves as staff's testimony on a proposal.

This staff assessment is only one piece of evidence that will be considered by the Committee (two Commissioners who have been assigned to this project) in reaching a decision on whether or not to recommend that the full Energy Commission approve the proposed project. At the public hearings, all parties will be afforded an opportunity to present evidence and to rebut the testimony of other parties, thereby creating a hearing record on which a decision on the project can be based. The hearing before the Committee also allows all parties to argue their positions on disputed matters, if any, and it provides a forum for the Committee to receive comments from the public and other governmental agencies.

Following the hearings, the Committee's recommendation to the full Energy Commission on whether or not to approve the proposed project will be contained in a document entitled the Presiding Members' Proposed Decision (PMPD). Following publication, the PMPD is circulated in order to receive written public comments. At the conclusion of the comment period, the Committee may prepare a revised PMPD. A revised PMPD will be circulated for a comment period to be determined by the Committee. At the close of the comment period for the revised PMPD, the PMPD is submitted to the full Energy Commission for a decision. Within 30 days of the Energy Commission decision, any intervenor may request that the Energy Commission reconsider its decision.

A Compliance Monitoring Plan and General Conditions will be assembled from conditions contained in the FSA and other evidence presented at the hearings. The

Compliance Monitoring Plan and General Conditions will be presented in the PMPD. Commission staff's implementation of the plan ensures that a certified facility is constructed, operated, and closed in compliance with the conditions adopted by the Energy Commission. Staff's proposed description of the contents of the Compliance Monitoring Plan and proposed General Conditions are included in the **GENERAL CONDITIONS** section of this PSA.

### **Agency Coordination**

As noted above, the Energy Commission certification is in lieu of any permit required by state, regional, or local agencies, and federal agencies to the extent permitted by federal law (Pub. Resources Code, § 25500). However, the Commission typically seeks comments from and works closely with other regulatory agencies that administer LORS that may be applicable to proposed projects. These agencies include the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, California Department of Fish and Game, and the California Air Resources Board.

# PROJECT DESCRIPTION

Bob Eller

## INTRODUCTION

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On October 30, 2003, Roseville Electric (RE or applicant) filed an Application for Certification (AFC), for its proposed Roseville Energy Park (REP) with the California Energy Commission seeking approval to construct and operate a 120 to 125 megawatt (MW) natural gas-fired, combined-cycle electric generating facility. The plant will be owned and operated by RE. The facility will have the ability to operate at 160 MW (nominal) during summer design conditions. The Energy Commission determined the application to be data adequate on December 17, 2003. This determination initiated staff's independent analysis of the proposed project.

The REP and related facilities, such as natural gas pipelines, are under the Energy Commission's jurisdiction. When issuing a license, the Energy Commission acts as lead state agency under the California Environmental Quality Act (CEQA), and its process is certified by the State Resources Agency as a separate program that satisfies the core CEQA requirements.

## ROSEVILLE ENERGY PARK

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### LOCATION

The REP would be located on a 12-acre site that lies within a 40-acre City of Roseville parcel. The project site is within the limits of the City of Roseville, adjacent to and north of the Pleasant Grove Waste Water Treatment Plant (PGWWTP). The project site is owned by the City of Roseville and is zoned Public/Quasi-Public. Surrounding land uses currently include ranching (agricultural grazing) and rural residential. The project area to the south, east, and west, however, is proposed for residential, industrial, and commercial development under the West Roseville Specific Plan (WRSP). The WRSP is a plan for annexation and development of 3,162 acres and was approved by the City Council in February, 2004. Build-out of the WRSP will take place over approximately 10 years. **PROJECT DESCRIPTION Figure 1** shows the regional setting and **PROJECT DESCRIPTION Figure 2** provides the local setting for the proposed project.

### PROJECT EQUIPMENT AND LINEAR FACILITIES

As proposed, the REP power train will consist of the following: 1) two General Electric LM6000 PC SPRINT or Alstom GTX100 combustion turbine-generators (CTGs), equipped with water injection (for the LM6000) or dry low-NO<sub>x</sub> combustors (for the GTX100) to control oxides of nitrogen (NO<sub>x</sub>) and evaporative coolers for reducing inlet air temperatures; 2) two heat recovery steam generators (HRSGs) with duct burners; 3) selective catalytic reduction (SCR) and oxidation catalyst equipment to control NO<sub>x</sub> and carbon monoxide (CO) emissions, respectively; 4) a single condensing steam turbine generator (STG); 5) a deaerating surface condenser; 6) a mechanical draft cooling tower; and 7) associated support equipment.

Each CTG will generate approximately 43 to 47 MW at annual average ambient conditions. The CTG exhaust gases will be used to generate steam in the HRSGs. The HRSGs will employ a two-steam-pressure design with duct firing equipment. Steam from the HRSGs will be admitted to a condensing STG. The STG will produce approximately 75 to 87 MW under average annual ambient conditions with HRSG duct firing. The project is expected to have an overall annual availability of approximately 95 percent.

Associated equipment includes the emission control systems needed to meet the proposed emission limits for oxides of nitrogen (NO<sub>x</sub>), a maximum of 2.0 (average basis) parts per million by volume, dry basis (ppmvd), corrected to 15 percent oxygen, by a combination of water-injected or dry low NO<sub>x</sub> combustors in the CTGs and SCR systems in the HRSGs. Carbon monoxide (CO) will be controlled to a maximum of 4.0 ppmvd at 15 percent oxygen under all operating conditions by means of an oxidation catalyst.

### **Natural Gas Facilities**

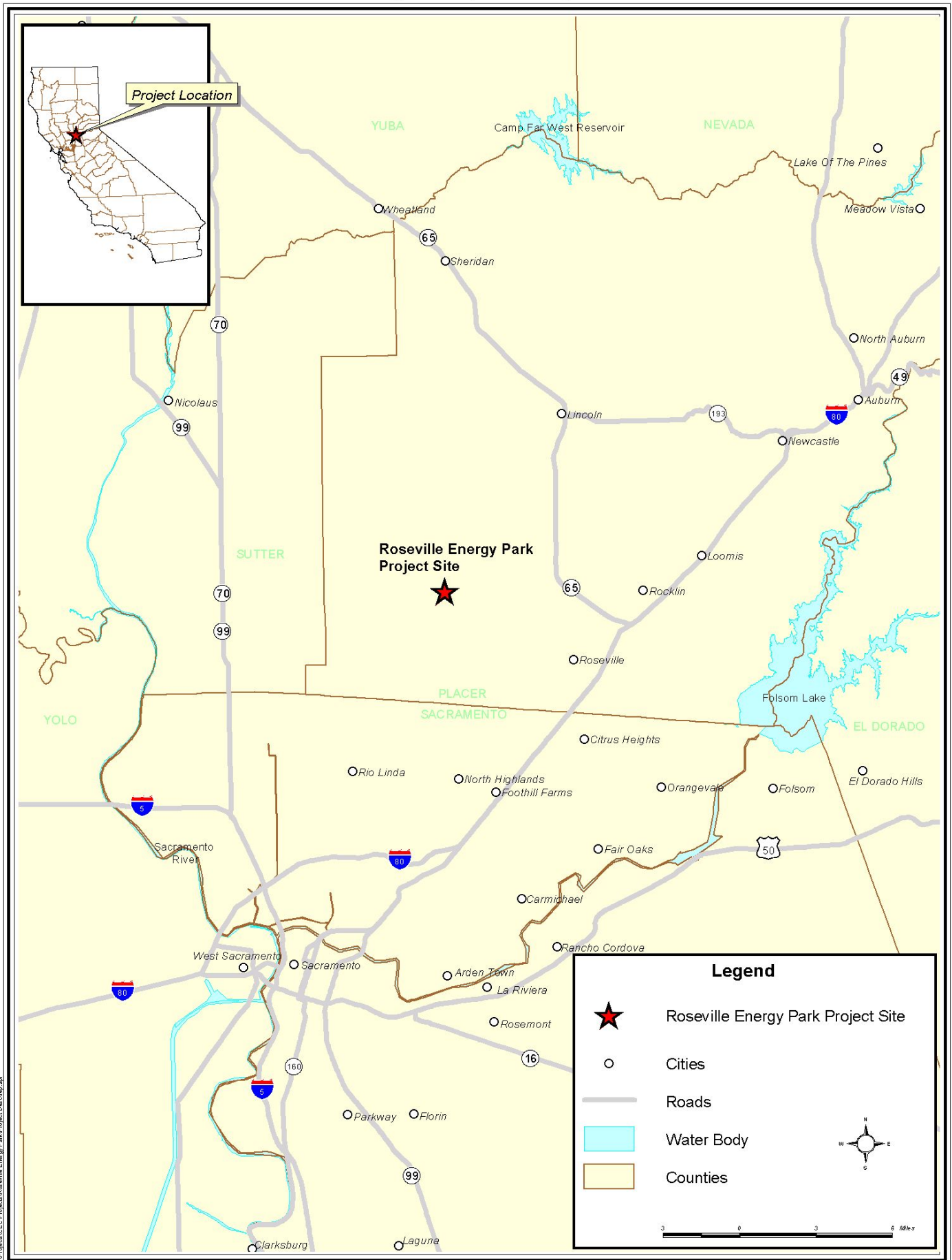
The REP will be designed to burn only natural gas. Natural gas will be delivered to the site via a new 6-mile pipeline. This pipeline will extend from its interconnection to PG&E's Line 123 near the corner of Baseline and Country Club roads. The pipeline would travel west along Baseline Road and turn north along Fiddymont Road. At the intersection with Blue Oaks Boulevard the route turns west into the WRSP area and continues along the future extension of Blue Oaks Boulevard. The pipeline would then turn south into the future alignment of Phillip Road and then west on the existing alignment of Phillip Road. The pipeline would then turn into the REP site at the gas metering station. **PROJECT DESCRIPTION Figure 2** depicts the proposed alignment for the natural gas pipeline.

This gas line route was chosen by the applicant in order to avoid the 1,500 foot distance criterion established by the California Department of Education for placement of hazardous materials (i.e., natural gas) within close proximity of proposed school sites designated in the West Roseville Specific Plan.

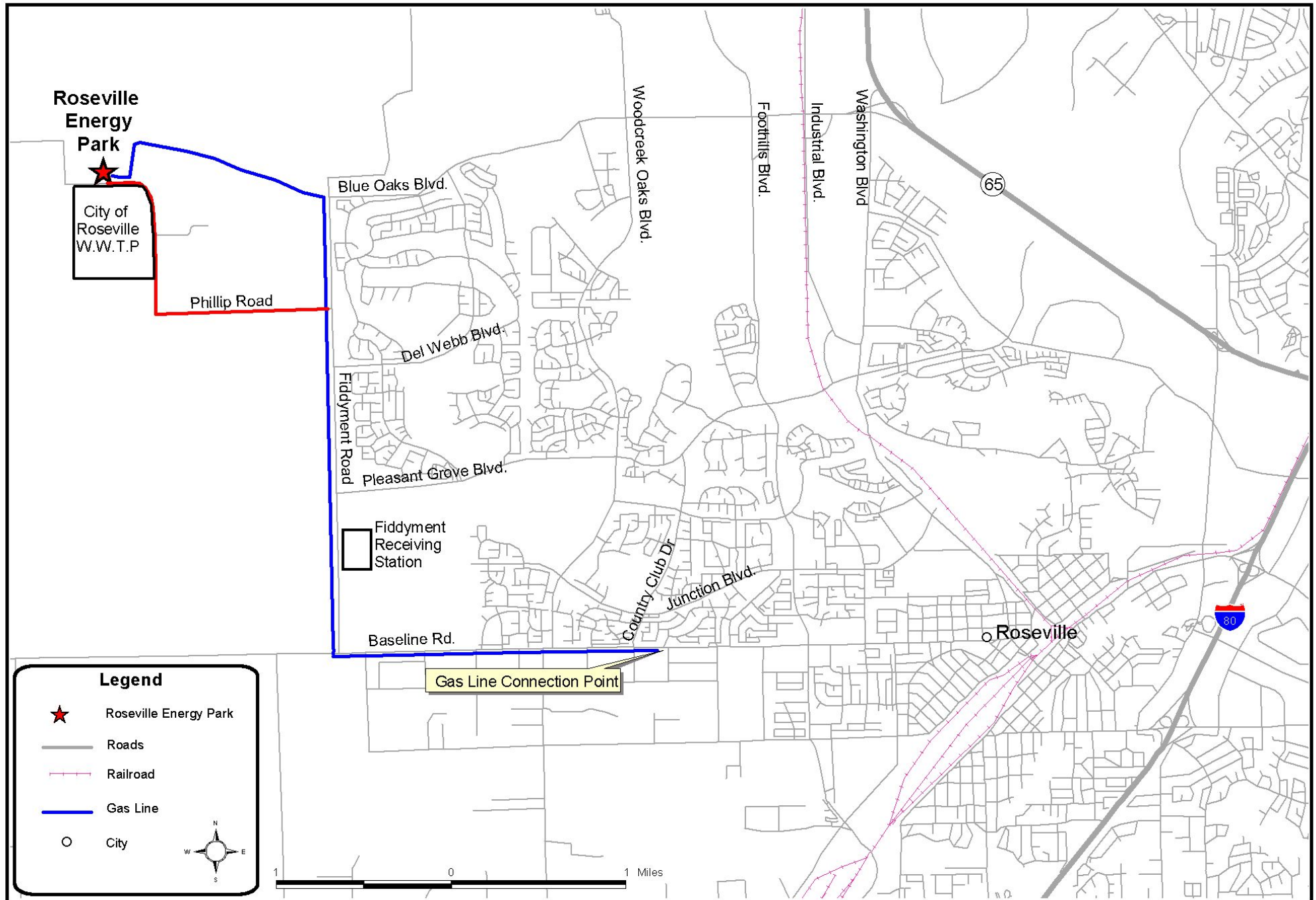
Construction of the pipeline would be primarily by open trench. However, where the pipeline crosses busy paved roads, jack and bore techniques may be used for the crossing. The crossing of Kaseberg Creek would use horizontal directional drill (HDD) techniques

Under average ambient conditions the REP would consume 19,820 million Btu per day, lower heating value, without HRSG duct firing.

**PROJECT DESCRIPTION - FIGURE 1**  
**Roseville Energy Park Project Site - Regional Location**



**PROJECT DESCRIPTION - FIGURE 2**  
 Roseville Energy Park Project Site - Local Setting



## **Water Supply and Waste Water Treatment**

The City of Roseville will provide the industrial process water supply for the REP from the PGWWTP. The PGWWTP will supply tertiary-treated, recycled water to meet cooling and other process makeup, landscape irrigation, and fire fighting requirements.

Water required for potable uses will initially be provided from an existing well located on the REP site. The City of Roseville potable water distribution system will eventually be extended to serve the area surrounding the REP site as part of the build-out of the WRSP. When this occurs, the REP's potable water system will be connected to the City water main and the on-site well will be disconnected.

A more detailed description of the water supply system, treatment, and permits is provided in **Soil and Water Resources** section of this Preliminary Staff Assessment.

## **Electric Transmission**

Electricity produced by the facility will be transmitted to RE grid. The generator output will be connected to three generator step-up transformers which will increase the voltage to 60 kV. Each transformer will then connect to the REP switchyard. From the switchyard, power will be transmitted to RE's grid by looping a new 60 kV transmission line into the REP switchyard. This new 60 kV line, constructed as part of the West Roseville Specific Plan (WRSP) build-out, will be a double-circuit line running from RE's Fiddymont Receiving Station to a new WRSP substation and passing adjacent to the REP. The new WRSP 60 kV lines will be routed along the south boundary of the REP site. A detailed discussion of the transmission system is provided in **Transmission System Engineering** section of this Preliminary Staff Assessment.

## **PROJECT CONSTRUCTION**

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Construction of the REP would take place over approximately 15 months, from Spring 2005 to the Summer of 2006. Plant testing is expected to commence in the Fall of 2005, with commercial operation expected in the Summer of 2006.

## **FACILITY CLOSURE**

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The REP will be designed for an operating life of 30 years. At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts.

Although the setting for this project does not appear to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made which provide the flexibility to deal with the specific situation and project setting at the time of closure. LORS pertaining to facility closure are identified in the technical sections of this assessment. Facility closure will be consistent with laws, ordinances, regulations and standards in effect at the time of closure.

## REFERENCES

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Roseville Electric, Roseville, California (ROSEVILLE) 2003a. Application for Certification Volumes I & II. Submitted to the Docket on October 30, 2003.



# **ENVIRONMENTAL ASSESSMENT**

# AIR QUALITY

Joseph M. Loyer

## INTRODUCTION

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This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants due to the planned construction and operation of the Roseville Energy Park (REP) as proposed by Roseville Electric (RE), the City of Roseville's electric utility. Criteria air pollutants are defined as those for which a state or federal ambient air quality standard has been established to protect public health. They include nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), ozone (O<sub>3</sub>), volatile organic compounds (VOC) and particulate matter less than 10 microns in diameter (PM<sub>10</sub>) and less than 2.5 microns in diameter (PM<sub>2.5</sub>).

In carrying out this analysis, the California Energy Commission staff evaluated the following major points:

- whether the REP is likely to conform with applicable Federal, State and Placer County Air Pollution Control District (PCAPCD or District) air quality laws, ordinances, regulations and standards, as required by Title 20, California Code of Regulations (CCR), section 1744 (b);
- whether the REP is likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards, as required by Title 20, CCR, section 1742 (b); and
- whether the mitigation proposed for the REP is adequate to lessen the potential impacts to a level of insignificance, as required by Title 20, CCR, section 1742 (b).

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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### FEDERAL

Under the Federal Clean Air Act (40 CFR 52.21), there are two major components of air pollution law, New Source Review (NSR) and Prevention of Significant Deterioration (PSD). NSR is a regulatory process for the evaluation of those pollutants that violate the federal ambient air quality standards. Conversely, PSD is a regulatory process for the evaluation of pollutants that do not violate the federal ambient air quality standards. The NSR analysis has been delegated by the U.S. Environmental Protection Agency (U.S. EPA) to the Placer County Air Pollution Control District (District). The U.S. EPA determines the conformance with the PSD regulations. The PSD requirements apply only to those projects that emit pollutants in excess of 100 tons per year (known as major sources).

### STATE

The California State Health and Safety Code, section 41700, requires that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerate

number of persons or the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.”

## **LOCAL – PLACER COUNTY AIR POLLUTION CONTROL DISTRICT**

The proposed project is subject to all PCAPCD rules and regulations that the Air Pollution Control Officer finds to be applicable. The applicability of these rules and regulations are discussed fully in the Preliminary Determination of Compliance (PDOC) issued by the District on May 25, 2004 (PCAPCD 2004a). These rules and regulations include common prohibitions against visibility impairment and nuisance from air emissions, as well as, specific NSR procedural requirements. While it is required that REP comply with all applicable rules and regulations, the District NSR rule is the most relevant for the REP.

### **Rule 502 – New Source Review**

This rule codifies the scope, process and requirements for the District to issue a Determination of Compliance (DOC), Authority to Construct (ATC) and a Permit to Operate (PTO) within the California Energy Commission’s (Commission) California Environmental Quality Act (CEQA) equivalent process. This rule includes the requirement for determining the Best Available Control Technology (BACT) for the class and category of emitting device. It includes the standard for establishing emission limits on an hourly, daily and quarterly basis and establishes precursor pollutants, offset triggers, offset ratios, and distance ratios needed for the determination of offsetting requirements. Additionally, this rule establishes the ability of the Air Pollution Control Officer to determine an appropriate interpollutant trading ratio.

## **ENVIRONMENTAL SETTING**

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### **METEOROLOGICAL CONDITIONS**

The general climate of California is typically dominated by the eastern pacific high pressure system centered off the coast of California. In the summer, this system results in low inversion layers with clear skies inland and typically early morning fog by the coast. In winter, this system promotes wind and rainstorms originating in the Gulf of Alaska and striking Northern California.

The climate of California’s Central Valley is characterized as Mediterranean with overall moderate annual temperatures and precipitation occurring primarily in the winter months. The Sacramento Valley Air Basin, located in the northern portion of the Central Valley, experiences summer high temperatures of up to 115 °F and winter lows to 15 °F with annual precipitation of approximately 23 inches in the vicinity of the REP site.

The REP site is located approximately five miles northwest of the City of Roseville, adjacent to the Pleasant Grove Waste Water Treatment Plant. The surrounding topography is typified by flat to rolling hills in all directions and is approximately 95 feet above mean sea level in elevation.

The prevailing daylight wind patterns are from the south or south-southeast and diurnal winds from the north or north-northwest with an overall annual average windspeed of 3.5 meters per second. The relative humidity ranges from 30 to 90 percent with occasional lingering heavy fog in the winter months.

## **EXISTING AIR QUALITY**

The Federal Clean Air Act and the California Clean Air Act both require the establishment of allowable maximum ambient concentrations of air pollutants, called ambient air quality standards (AAQS). The state AAQS, established by California Air Resources Board (CARB), are typically lower (more restrictive) than the federal AAQS, which are established by the U.S. EPA. The state and federal air quality standards are listed in **AIR QUALITY Table 1**. As indicated in **AIR QUALITY Table 1**, the averaging times for the various air quality standards (the duration over which they are measured) range from one-hour to an annual average. The standards are read as a concentration, in parts per million or as a weighted mass of material per a volume of air, in milligrams or micrograms of pollutant in a cubic meter ( $\text{mg}/\text{m}^3$  and  $\text{ug}/\text{m}^3$ ).

In general, an area is designated as attainment for a specific pollutant if the ambient concentrations of the air contaminant do not exceed the standard. Likewise, an area is designated as non-attainment for an air contaminant if that standard is violated. Where not enough ambient data are available to support a designation, the area can be designated as unclassified. Unclassified areas are normally treated the same as attainment areas for regulatory purposes. An area can be in attainment for one air contaminant while non-attainment for another or attainment for the federal standard and non-attainment for the state standard for the same contaminant. The entire area within the boundaries of a district is usually evaluated to determine the district's attainment status.

The REP is located in the City of Roseville and is under the jurisdiction of the Placer County Air Pollution Control District. **AIR QUALITY Table 2** shows the attainment or non-attainment status of the District for each criteria pollutant for both federal and state ambient air quality standards.

### **Federal Non-Attainment Pollutants**

Ozone ( $\text{O}_3$ ) is not directly emitted from a stationary or mobile source. It is formed as a result of chemical reactions in the atmosphere between  $\text{NO}_x$  and VOC emissions that interact in the presence of sunlight. Ozone formation occurs in the Sacramento Region, primarily northeast of the Sacramento downtown area between Roseville and Auburn. AIR QUALITY Figure 1 is a graphical representation of the relative ambient ozone concentration levels measured at 22 ambient air quality monitoring stations. The numeric values are in terms of Air Quality Index (API) and not actual ozone concentrations; however, API is calculated in proportion to ozone measurements in addition to other factors. Thus, the differences in color show the relative ozone concentrations, while the values show the actual API.

**AIR QUALITY Table 1**  
**Federal and State Ambient Air Quality Standards**

<b>Pollutant</b>	<b>Averaging Time</b>	<b>Federal Standard</b>	<b>California Standard</b>
Ozone (O <sub>3</sub> )	8 hour	0.08 ppm (157 ug/m <sup>3</sup> )	---
	1 hour	0.12 ppm (235 ug/m <sup>3</sup> )	0.09 ppm (180 ug/m <sup>3</sup> )
Carbon Monoxide (CO)	8 hour	9 ppm (10 mg/m <sup>3</sup> )	9 ppm (10 mg/m <sup>3</sup> )
	1 hour	35 ppm (40 mg/m <sup>3</sup> )	20 ppm (23 mg/m <sup>3</sup> )
Nitrogen Dioxide (NO <sub>2</sub> )	Annual Average	0.053 ppm (100 ug/m <sup>3</sup> )	---
	1 hour	---	0.25 ppm (470 ug/m <sup>3</sup> )
Sulfur Dioxide (SO <sub>2</sub> )	Annual Average	3 ppm (80 ug/m <sup>3</sup> )	---
	24 hour	0.14 ppm (365 ug/m <sup>3</sup> )	0.04 ppm (105 ug/m <sup>3</sup> )
	3 hour	0.5 ppm (1300 ug/m <sup>3</sup> )	---
	1 hour	---	0.25 ppm (655 ug/m <sup>3</sup> )
Fine Particulate Matter (PM <sub>10</sub> )	Annual	50 ug/m <sup>3</sup>	20 ug/m <sup>3</sup>
	24 hour	150 ug/m <sup>3</sup>	50 ug/m <sup>3</sup>
Ultra Fine Particulate Matter (PM <sub>2.5</sub> )	Annual	15 ug/m <sup>3</sup>	12 ug/m <sup>3</sup>
	24 hour	65 ug/m <sup>3</sup>	---
Sulfates (SO <sub>4</sub> )	24 hour	---	25 ug/m <sup>3</sup>
Lead	30 Day Average	---	1.5 ug/m <sup>3</sup>
	Calendar Quarter	1.5 ug/m <sup>3</sup>	---
Hydrogen Sulfide (H <sub>2</sub> S)	1 hour	---	0.03 ppm (42 ug/m <sup>3</sup> )
Vinyl Chloride (chloroethene)	24 hour	---	0.010 ppm (26 ug/m <sup>3</sup> )
Visibility Reducing Particulates	1 observation	---	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

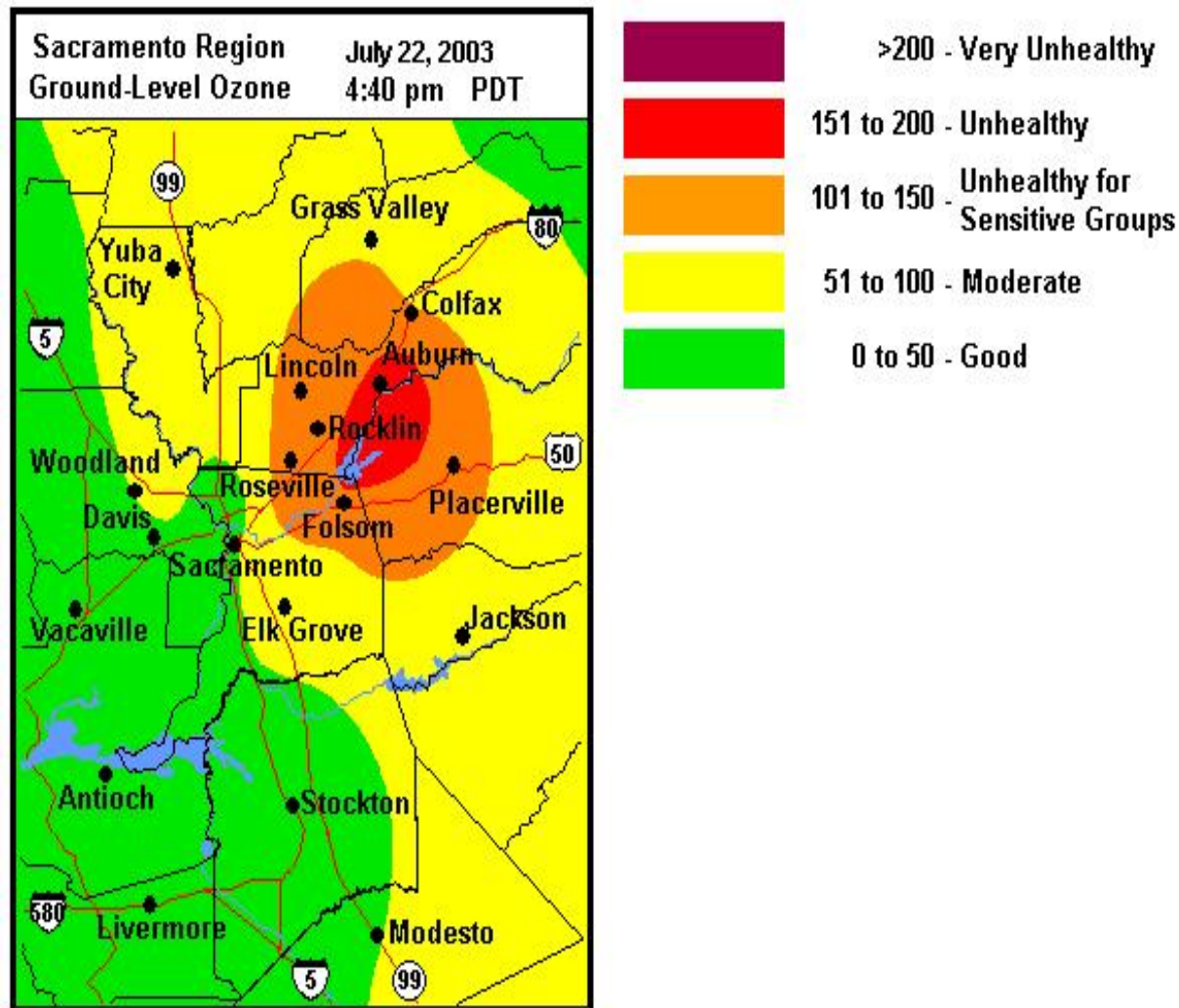
**AIR QUALITY Table 2**  
**Attainment/ Non-Attainment Classification**  
**Placer County Air Pollution Control District**

<b>Pollutants</b>	<b>Federal Classification</b>	<b>State Classification</b>
Ozone 1-hour	Non-Attainment	Non-Attainment
Ozone 8-hour	Non-Attainment	---
PM10	Unclassified	Non-Attainment
PM2.5	Designation recommended by CARB to be Attainment	Non-Attainment
CO	Attainment	Unclassified
NO <sub>2</sub>	Attainment	Attainment
SO <sub>2</sub>	Attainment	Attainment

AIR QUALITY Figure 1 is an example of an ozone excursion, a day when pollution levels exceed the federal ozone ambient air quality standards. These excursions were registered at ambient air quality monitoring stations from Roseville to Auburn (the orange and red zones). While this is a graphic representation of a specific day and time, it is representative of days when ozone exceedances occur. Full animations of this day and other days are available at [www.SparetheAir.com](http://www.SparetheAir.com).



# **AIR QUALITY Figure 1** **Example of Ozone Excursion – Sacramento Region**



**Source:** Sacramento Metropolitan Air Quality Management District and the air districts of the Sacramento region. Copyright 2003-2004. Ozone Movie Archive, July 22, 2003 at 4:40 PM. Note that values are represented in terms of Air Quality Index, not ozone concentration.





## **New Ozone and PM Standards**

As indicated in **AIR QUALITY Table 2**, an attainment designation has been ratified by EPA for the District for the federal 8-hour ozone standard and an attainment designation has been proposed for the federal PM<sub>2.5</sub> standard. However, a State Implementation Plan (SIP) has not been developed or ratified as of this date. Until the 8-hour Ozone and (PM<sub>2.5</sub> for other areas) Attainment Plan is developed and ratified, it is assumed that the state will rely on the implementation of the 1-hour ozone SIP. The California Air Resources Board (CARB) is actively developing (with local air districts and other agencies) both an 8-hour ozone and PM (PM<sub>10</sub> and PM<sub>2.5</sub>) SIP for those areas that are designated federal non-attainment. Furthermore, CARB (as directed under Senate Bill 656) is developing a list of measures for reducing PM (PM<sub>10</sub> and PM<sub>2.5</sub>) by January 1, 2005. CARB, local air districts and other state agencies will adopt related implementation schedules by July 31, 2005. The goal is to make progress toward attainment of state and federal PM<sub>10</sub> and PM<sub>2.5</sub> standards. The proposed control measures are to be based on rules, regulations, and programs existing in California as of January 1, 2004 to reduce emissions from new, modified, or existing stationary, area, and mobile sources.

## **Local Air Quality Monitoring**

The project location on AIR QUALITY Figure 1 is indistinguishable from the dot representing the City of Roseville. The closest ambient air quality monitoring stations to the project location are at North Highlands on Blackfoot Way (to the southwest), the Roseville station on N. Sunrise Blvd (to the northeast) and at Rocklin on Rocklin Rd (further northeast). After extensive review of the available ambient air quality monitoring data from these three stations, staff recommends measurements in **AIR QUALITY Table 3** to be reasonably representative of the expected background ambient air quality. A more detailed discussion of the available data is presented in **Appendix A**.

The background ambient air quality data shows current violations of the 1-hour and 8-hour ozone federal ambient air quality standards (as well as the 1-hour ozone state ambient air quality standard). Additionally, the background data shows violations of the PM<sub>10</sub> 24-hour, PM<sub>10</sub> annual and PM<sub>2.5</sub> annual state ambient air quality standards. Finally, the background data shows that there are no violations of the NO<sub>2</sub>, SO<sub>2</sub> or CO state or federal ambient air quality standards.

**AIR QUALITY Table 3**  
**Staff Recommended Background Pollution Concentrations**

Pollutant	Averaging Time	Measurement		Station	Date
		ug/m <sup>3</sup>	ppm		
Ozone	8-hour	233	0.119	Rocklin	1998
	1-hour	300	0.153	Roseville	1998
PM10	Annual	25.2	--	Roseville	2002
	24-hour	62.0	--	Roseville	2001
PM2.5	Annual	13.4	--	Roseville	1999
	24-hour	53	--	Roseville	2002
CO	8-hour	3,122	2.81	Roseville	2002
	1-hour	5,257	4.6	Roseville	2002
NO <sub>2</sub>	Annual	30.2	0.016	Roseville	2002
	1-hour	182.4	0.097	Roseville	1998
SO <sub>2</sub>	Annual	0.05	0.002	North Highlands	2002
	24-hour	28.7	0.011	North Highlands	2001
	3-hour	31.2	0.012	North Highlands	2001
	1-hour	49.8	0.019	North Highlands	2002

Source: California Air Resources Board

### **Ammonia Inventory**

PM10/PM2.5 can be formed downwind from an emission source as a secondary emission (similar to ozone) from a reaction between ammonia and airborne acids. The most dominant reactions are between SO<sub>x</sub> emissions (as sulfuric acid, H<sub>2</sub>SO<sub>4</sub>) and NO<sub>x</sub> emissions (as nitric acid, HNO<sub>3</sub>). The complexity of these reactions arises from the formation of gaseous, liquid and solid forms of the products and reactants involved. The qualitative understanding of these reactions indicates that all the available ammonia will be reacted with all the available sulfuric acid prior to any ammonia being reacted with any available nitric acid (Seinfeld 1986). From this presumption, two cases of interest arise. The sulfate rich case (or ammonia limited), where the molar ratio of ammonia (NH<sub>3</sub>) to sulfate (SO<sub>4</sub>) is less than two, so that there is insufficient ammonia to react with the sulfate. The ammonia rich case, where the molar ratio of ammonia to sulfate is greater than two, so that the sulfate is completely reacted and there is excess ammonia (Seinfeld 1986).

For the purpose of determining the secondary PM10/PM2.5 potential impacts, it is necessary to determine first, if the area is either ammonia rich or ammonia limited as discussed above, and second, to determine what additional ammonium sulfate and ammonium nitrate are likely to form. Lastly, those impacts must be compared to the existing background measurements. Unfortunately, no information is available to complete any of these steps. What can be done is to determine if the potential exists for ammonia, SO<sub>x</sub> and NO<sub>x</sub> emissions from the proposed REP facility to contribute to an existing violation of the PM10 or PM2.5 state ambient air quality standards.

There is no ammonia inventory data available for Placer County. However, from ammonia inventories of other counties and air districts (as well as the state inventory), it is clear that such inventories are dominated by livestock (45 percent statewide), on-road mobile (19 percent statewide) and composting, fertilizers, and other agricultural sources

(19 percent statewide). Currently, there are two ammonia inventories available from CARB in addition to the state inventory: San Joaquin Valley Air Pollution Control District (2000) and South Coast Air Quality Management District (2000). Staff has modified the San Joaquin inventory slightly such that, in staff's opinion, the resulting inventory is a reasonable estimate of what the Placer County ammonia inventory might be.

Less than one percent of employees in Placer County are engaged in the Agricultural sector while Trade, Transportation, & Utilities sector makes up close to 20 percent of the county's total employment in 2002 (SRRI 2004). Therefore, it is reasonable to assume that the Placer County ammonia inventory (if one existed) would not have significant contributions from livestock or agricultural sources. That leaves on-road mobile sources as the only major contributor to a Placer County ammonia inventory. Staff eliminated the majority of the livestock, composting and fertilizer contributions from the San Joaquin Valley ammonia inventory so that it could be used as a proxy to more closely reflect the expectations of a Placer County ammonia inventory. Thus, staff estimates the ammonia inventory to be approximately 36 tons/day (for further discussion, see **Appendix B**).

In comparison to the ammonia rich areas of San Joaquin Valley (368.7 tons/day) and the South Coast (181.7 tons/day), the estimated ammonia inventory of Placer County (36 tons/day) leads staff to presume that the area is most likely ammonia limited. Thus, as discussed above, it is likely that the release of further ammonia would lead to further PM10/PM2.5 formation downwind. However, it is not possible to determine the rate at which this could occur with the available information. Therefore, staff concludes that the release of ammonia slip from the REP facility has a high likelihood of forming additional PM10/PM2.5 downwind and thus contributing to an existing violation of the PM10 or PM2.5 state ambient air quality standards.

## **PROJECT DESCRIPTION AND EMISSIONS**

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### **CONSTRUCTION**

#### **Project Site**

The REP facility will take approximately 20 months to construct. The power plant project construction consists of three major areas of activity: 1) the civil/structural construction; 2) the mechanical construction; and 3) the electrical construction. The largest fugitive dust emissions are generated during the civil/structural activity, where work such as demolition, grading, site preparation, foundations, underground utility installation and building erection occur. These types of activities require the use of large earth moving equipment, which generate considerable fugitive dust and combustion emissions. The mechanical construction includes the installation of the heavy equipment, such as the combustion and steam turbines, the heat recovery steam generators, condenser, pumps, piping and valves. The use of large cranes to install such equipment generates significantly more combustion emissions than other construction equipment onsite. Finally, the electrical equipment installation involves such items as transformers, switching gear, instrumentation and wiring. This is a relatively small emission-generating activity in comparison to the early construction activities.

The City of Roseville currently utilizes the proposed site for the REP facility for equipment storage and lay down area. The proposed REP site is approximately seven acres, with the majority of the construction activities focused on three acres (Roseville 2003b). The small amounts of demolition, grading and site preparation coupled with the mitigation measures that the applicant has agreed to are not expected to result in a significant amount of fugitive dust. The applicant also offered construction mitigation measures to reduce both fugitive dust and combustion PM10. **AIR QUALITY Table 4** shows the expected emissions from construction activities at the site with the following mitigation measures employed as proposed by the RE:

- Watering all unpaved roads and disturbed areas in the project and linear construction sites as necessary to prevent fugitive dust plumes.
- Limiting construction site speed to 10 miles per hour.
- Inspecting and washing vehicle tires so they are free of dirt prior to entering paved roadways.
- Using gravel or other roadway stabilizers as necessary.
- Using sandbags or other measures to prevent run-off to roadways.
- Covering or stabilizing all soil storage piles and disturbed areas.
- All transport solid bulk will be provided with a cover, or provide at least one foot of freeboard.
- Employing wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) will be used on all construction areas that may be disturbed.

**AIR QUALITY Table 4  
Estimated Construction Emissions**

	<b>NOx</b>	<b>CO</b>	<b>VOC</b>	<b>SOx</b>	<b>PM10</b>
<b>Daily (lbs/day)</b>					
Combustion Equipment	291.2	360.7	52.2	23.9	17.0
Fugitive Dust	--	--	--	--	4.52
<b>Annual (tons/year)</b>					
Combustion Equipment	10.8	35.7	4.4	0.6	1.0
Fugitive Dust	--	--	--	--	0.60
<b>Total (20 month) Construction Period (tons/year)</b>					
Combustion Equipment	18.0	59.5	7.3	1.0	1.65
Fugitive Dust	--	--	--	--	1.0
Note: Combustion emissions include construction equipment, truck and rail deliveries, and worker transportation. Fugitive dust emissions include emissions from construction activities, truck and rail deliveries and worker travel.					

Source: (Roseville 2003a)

## **Linear Facilities**

The linear facilities will include 6.4 miles of new natural gas pipeline, approximately 6.6 miles of transmission line and approximately 100 feet of reclaimed water pipeline. Given that the linear construction elements are short, staff has estimated that they will result in the minor emissions shown in **AIR QUALITY Table 5** with the assumptions shown.

**AIR QUALITY Table 5**  
**Estimated Total (2 Months) Linear Construction Emissions**  
**(Tons)**

	<b>NOx</b>	<b>CO</b>	<b>VOC</b>	<b>SOx</b>	<b>PM10</b>
<b>Combustion Equipment</b>	2.2	1.2	0.2	0.2	0.2
<b>Fugitive Dust</b>	--	--	--	--	0.4

Notes: Assumes the operation of four backhoes and two dump trucks, eight hours per day, 22 days per month for a total duration of two months and one acre of soil disturbance with no fugitive dust mitigation measures.

## **OPERATION**

RE is proposing to license two optional power plant configurations, one based on the GE LM6000 combustion turbine, and the other based on the Alstom GTX100 turbine. Both are proposed to be a two-on-one design, which are two combustion turbines with supplemental duct fired heat recovery steam generators and one steam generator. Both options will be designed to reach a nominal capacity of approximately 120 to 125 MW with peak capability (including the duct burners) of 160 MW.

## **Equipment Description**

The major equipment at the REP facility will include one of these two options:

<b>Option</b>	<b>Turbine</b>	<b>Duct firing at the HRSG</b>	<b>Steam Generator</b>
1	GE LM6000 PC Sprint Input heat rate: 446.8 MMBtu/hr Nominal output: 47 MW Water Injected Combustors	Input heat rate 255 MMBtu/hr	Nominal Output 30 MW
2	Alstom GTX100 Input heat rate: 457.3 MMBtu/hr Nominal output: 43 MW Dry Low-NOx Combustors	Input heat rate 225 MMBtu/hr	Nominal Output 43 MW

Both options will include the following equipment:

- Two 120 feet high exhaust emission stacks to be directly preceded by ammonia injection into a selective catalytic reduction (SCR) and an oxidation catalyst;
- One auxiliary natural gas-fired boiler rated at 58 MMBtu/hr input heat rate and an output of 40,000 lbs steam per hour (600 psig);
- One 1,133 horsepower (hp) 750 kW diesel-fire emergency generator;
- One 300 hp diesel-fired firewater pump; and

- One four-cell cooling tower, with 54,414-gpm throughput and 0.0005percent drift rate.

### **Equipment Operation**

RE has proposed the operational schedule shown in **AIR QUALITY Table 6** for the REP facility.

**AIR QUALITY Table 6**  
**Proposed Power Plant Operational Schedule**  
**(Hours)**

	<b>1<sup>st</sup> Quarter</b>	<b>2<sup>nd</sup> Quarter</b>	<b>3<sup>rd</sup> Quarter</b>	<b>4<sup>th</sup> Quarter</b>	<b>Annual</b>
Base load Operation per Turbine	1,123	1,188	751	852	3,914
Peak Load Operation per Turbine/HRSG	929	559	1,347	1,246	4,081
Startup and Shutdown per Turbine	44	117	34	47	242
Total Hours of Operation per Turbine	2096	1864	2132	2145	8237
Auxiliary Boiler	140	568	143	143	995
Emergency Generator	12.5	12.5	12.5	12.5	50
Firewater Pump	12.5	12.5	12.5	12.5	50

Source (Roseville 2003b)

The REP facility is assumed to operate at a base load of approximately 120 to 125 MW firing both combustion turbine generators (CTGs) with no duct firing and a peak load of 160 MW with duct firing. Startup will consist of 167 hot starts (one-hour duration), 30 warm starts (two-hour duration) and five cold starts (three-hour duration) for a total of 242 hours of startup for each turbine.

The auxiliary boiler is proposed to provide steam when the CTGs are not operating, but not for the purpose of generating electric power. It will provide steam for HRSG for drum sparging, condenser hotwell sparging, steam turbine glands, and deaeration when the plant is offline. The firewater pump and emergency generator are to be used in emergency conditions and will be tested weekly running 30 minuets for test.

### **Equipment Controls**

The exclusive use of an inherently clean fuel, natural gas, will limit the formation of SO<sub>2</sub>, PM2.5 and PM10 emissions. Natural gas contains very small amounts of a sulfur compound known as mercaptan, which when combusted, results in sulfur compound emissions of SO<sub>2</sub> in the flue gas. However, in comparison to other fuels used in power plants, such as fuel oil or coal, the sulfur content of natural gas is very low. Similar to SO<sub>2</sub>, the emissions of PM2.5 and PM10 from natural gas combustion are very low compared to the combustion of fuel oil or coal. Natural gas contains very little noncombustible gas or solid residue; therefore, it is a relatively clean-burning fuel.

CO and VOC emissions will be controlled through the application of an oxidizing catalyst. NOx emissions will be controlled through ammonia injection in conjunction with SCR. In addition to these post-combustion controls, the GTX100 turbines will employ Dry Low-NOx combustors and the LM6000 turbines will employ water injection into the combustors to reduce the formation of NOx emissions.

## **Operating Emissions**

**AIR QUALITY Table 7** shows the maximum expected air emissions as proposed by RE. The estimated maximum expected emissions from the REP facility are based on the following assumptions (for further discussion, see **Appendix C**).

**AIR QUALITY Table 7**  
**Maximum Expected Operational Emissions**

	NOx		SO <sub>2</sub>		CO		VOC		PM10	
	LM6000	GTX100	LM6000	GTX100	LM6000	GTX100	LM6000	GTX100	LM6000	GTX100
Hourly (lbs/hr)	43.8	79.3	2.09	2.14	31.7	182.1	3.9	39.8	10.6	10.8
Daily (lbs/day)	288.9	425.4	48.07	49.15	354.8	683.6	89.9	229.4	252.4	257.6
Quarterly (tons/quarter)	9.68	10.27	1.82	1.85	11.75	16.94	3.30	3.73	9.50	9.69
Annual (tons/year)	36.24	39.56	6.69	6.83	44.09	59.86	12.17	13.42	35.28	35.95

Source: (Roseville 2003b)

### **Maximum Hourly Emissions**

The highest emissions of NOx, VOC and CO, for either of the proposed REP turbines/HRSG trains would occur during the startup sequence. For the maximum emissions of PM10 and SO<sub>2</sub>, the REP turbines/HRSG trains would both be in peak load operation. The auxiliary boiler is assumed to be at full potential output and the cooling tower at full operational load. Both the emergency generator and the firewater pump are assumed to be in standby mode (not operating) during all startup procedures.

### **Maximum Daily Emissions**

For the highest daily emissions of NOx, CO, and VOC (from the GTX100 only), the REP turbine/HRSG trains are assumed to have one cold start (three hour duration), one warm start (two hour duration) and 19 hours of peak load operation. For the emissions of SO<sub>2</sub>, PM10 and VOC emissions (from the LM6000 only), the REP turbine/HRSG trains are operating at peak load for 24 hours each. The auxiliary boiler is assumed to be at full potential output and the cooling tower is assumed to be at full operational load. The emergency generator and firewater pump are assumed to both be test-fired (30-minute duration each, not during startup).

### **Maximum Quarterly and Annual**

The maximum quarterly and annual emissions are based on the operational schedule provided in **AIR QUALITY Table 6**.



## **Ammonia Emissions**

RE proposes to control NO<sub>x</sub> emissions to 2.0 ppmv @ 15 percent O<sub>2</sub> averaged over one-hour through either the use of Dry Low-NO<sub>x</sub> combustors (GTX100) or water injected combustors (LM6000) and SCR. Significant amounts of ammonia will be injected into the flue gas stream as part of the SCR system. However, not all of this ammonia mixes in the flue gases within the catalyst of the SCR to reduce NO<sub>x</sub>; a portion of the ammonia passes through the SCR and is emitted unaltered, out the stacks. These ammonia emissions are known as ammonia slip. RE has committed to an ammonia slip no greater than 10 ppm @ 15 percent O<sub>2</sub>. On a daily basis, the ammonia slip of 10 ppm is equivalent to approximately 220.8 lbs/day (LM6000) or 228.0 lbs/day (GTX100) of ammonia emitted into the atmosphere per turbine. It should be noted that an ammonia slip of 10 ppm is usually associated with the significant degradation of the SCR catalyst. This degradation typically begins two years or more after initial operation. Prior to the ammonia slip exceeding 10 ppm, the SCR catalysts are removed and reconditioned or replaced with new catalysts. Through most of the operation of the SCR system, ammonia slip emissions are usually in the range of one to two ppm, corresponding to a mass emissions of approximately 22 to 46 pounds per day per turbine.

## **Initial Commissioning**

The initial commissioning of a power plant refers to the time frame between completion of construction and the consistent production of electricity for sale on the market. Normal operating emission limits usually do not apply during initial commissioning procedures. REP will go through several tests during initial commissioning. During the first set of tests, post-combustion controls will not be operational (i.e., the SCR and oxidation catalyst).

These tests start with a Full Speed-No Load test. This test runs the turbine at approximately 20 percent of its maximum heat input rate. Components tested include the ignition system, synchronization with the electric generator and the turbine-overspeed safety system. Part Load testing runs the turbines to approximately 60 percent of the maximum heat input rating. During this test the turbine and HRSG will be tuned and the HRSG steam lines will be checked. Full Load testing runs the turbines to their maximum heat input rate. This testing entails further tuning of the turbine and HRSG as well as the steam lines. Full Load –Partial SCR testing runs the turbines at 100 percent of their maximum heat input rate and operates the SCR ammonia injection grid for the first time. Finally, Full Load – Full SCR testing runs the turbines at their maximum heat input rate and operates the SCR ammonia inject grid at its full capacity. It is during this test that the SCR system will be completely tuned and operating at design levels (i.e., NO<sub>x</sub> control at 2.0 ppm).

Experience from recent licensing cases suggests that initial commissioning for a combined cycle system of this size last approximately 30 days. Additionally, daily operation of the turbines during the commissioning period is typically limited to several hours a day. RE has stated that the turbines would be operated, on average, not more than six hours in a single day during the initial commissioning period. RE has estimated that the approximate maximum emissions during commissioning (turbine operation without SCR or oxidation catalyst controls) for the LM6000 will be 28.9 lbs/hr NO<sub>x</sub> and

24 lbs/hr CO, and for the GTX100, 40 lbs/hr NOx and 1,000 lbs/hr CO. Staff finds these estimates to be reasonable, with the exception of the GTX100 CO emissions, which seem excessively high.

## **Facility Closure**

Eventually the REP facility will close, either as a result of the end of its useful life, or through some unexpected situation such as a natural disaster or catastrophic facility breakdown. When the facility closes, all sources of air emissions would cease and thus all impacts associated with those emissions would no longer occur.

The Permit to Operate, issued by the District, is required for operation of the facility and is usually renewed on a regular schedule. If RE chooses to close the REP facility and not pay the permit fees, then the Permit to Operate would be cancelled. In that event, the facility could not restart and operate unless RE pays the fees to renew the Permit to Operate.

If RE were to decide to dismantle the project, there would likely be fugitive dust emissions associated with this dismantling effort. The Facility Closure Plan to be submitted to the Energy Commission Compliance Project Manager should include the specific details regarding how RE plans to demonstrate compliance with the District Rules regarding fugitive dust emission limitations.

## **EMISSION IMPACTS ON AIR QUALITY**

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RE performed an air dispersion modeling analysis to evaluate the project's potential impacts on the existing ambient air pollutant levels, during both construction and operation. An air dispersion modeling analysis usually starts with a conservative screening level analysis. Screening models use very conservative assumptions, such as the meteorological conditions, which may or may not actually occur in the area. The impacts calculated by screening models, therefore, can be double or more than the actual or expected impacts. If the screening level impacts are significant, refined modeling analysis is performed. A major difference in the refined modeling is that hour by-hour meteorological data collected in the vicinity of the project site is used. The Industrial Source Complex Short-Term model, Version 3, known as the ISCST3 model, was used for the refined modeling.

## **CONSTRUCTION**

The results of the ISCST3 modeling analysis (see **AIR QUALITY Table 8**) showed that only construction PM10 emission impacts (24-hour and annual) are expected to contribute to an existing violation of the state PM10 (24-hour and annual) ambient air quality standards. From the modeling results file, the location of the PM10 impacts (both 24-hour and annual) would be approximately 740 feet southwest from the area under construction, which is in an area that is currently uninhabited. The closest residence is approximately 1,200 feet north of the project site, where the modeling predicts the PM10 impacts from construction would not occur. However, City employees work at the Pleasant Grove Waste Water Treatment Plant (PGWWTP), located directly adjacent to the REP proposed construction site. The distance and direction of the maximum predicted construction PM10 emission air quality impacts

suggest that these impacts may fall within the facility boundary of PGWWTP. Thus, it is reasonable to provide mitigation to the extent feasible for the protection of these employees.

**AIR QUALITY Table 8**  
**Maximum Predicted Construction Emission Air Quality Impacts**

Pollutant	Averaging Time	Direct Impacts (ug/m <sup>3</sup> )	Background (ug/m <sup>3</sup> )	Total Impact (ug/m <sup>3</sup> )	Limiting Standard (ug/m <sup>3</sup> )	Total Impact as a Percent of Standard
NO <sub>2</sub>	1-hour	242.9	182.4	425.3	470	90%
	Annual	7.623	30.2	37.8	100	38%
CO	1-hour	769.2	5,257	6,026	23,000	26%
	8-hour	419.7	3,122	3,542	10,000	35%
SO <sub>2</sub>	1-hour	161.4	49.8	211.2	655	32%
	24-hour	34.2	28.7	62.9	105	60%
	Annual	0.091	0.05	0.141	80	0%
PM <sub>10</sub>	<b>24-hour</b>	66.1	62.0	128.1	50	<b>256%</b>
	<b>Annual</b>	5.68	25.2	30.9	20	<b>154%</b>

Notes:

NO<sub>2</sub> 1-hour predicted impacts assume ozone limiting based on available ozone data between the expected construction activity hours of 8am and 4pm.

NO<sub>2</sub> annual predicted impacts assume an ARM ratio of 75%.

Background concentrations are from **AIR QUALITY Table 3**.

Source: (Roseville 2003a)

## OPERATION

The air quality impacts of project operation are shown in the following sections for fumigation meteorological conditions, and during the facility start-up and steady-state operations.

### Fumigation

During the early morning hours before sunrise, the air is usually very stable. During such stable meteorological conditions, emissions from elevated stacks rise through this stable layer and are dispersed. When the sun first rises, the air at ground level is heated, resulting in a vertical (both rising and sinking air) mixing of air for a few hundred feet or so. Emissions from a stack that enter this vertically mixed layer of air will also be vertically mixed, bringing some of those emissions down to ground level. Later in the day, as the sun continues to heat the ground, this vertical mixing layer becomes higher and higher, and the emissions plume becomes better dispersed. The early morning air pollution event, called fumigation, usually lasts approximately 30 to 90 minutes.

RE used the SCREEN3 model, which is a U.S. EPA approved model, for the calculation of fumigation impacts. **AIR QUALITY Table 9** shows the modeled fumigation results and impacts on the one-hour NO<sub>2</sub>, CO and SO<sub>2</sub> standards. Since fumigation impacts will not typically occur much beyond a one-hour period, only impacts on these one-hour standards were addressed. The results of the modeling analysis show that fumigation impacts will not violate the NO<sub>2</sub>, CO or SO<sub>2</sub> one-hour standards.

**AIR QUALITY Table 9**  
**Estimated Facility Fumigation One-hour Air Quality Impacts**

Pollutant	Direct Impact (ug/m <sup>3</sup> )		Background (ug/m <sup>3</sup> )	Total Impact (ug/m <sup>3</sup> )		Limiting Standard (ug/m <sup>3</sup> )	Total Impact as a Percent of Standard	
	LM6000	GTx100		LM6000	GTx100		LM6000	GTx100
NO <sub>2</sub>	24.3	25.0	182.4	206.7	207.4	470	44%	44%
CO	16.5	17.1	5,257	5,274	5,274	23,000	23%	23%
SO <sub>2</sub>	1.40	1.45	49.8	51.2	51.3	655	8%	8%
Notes								
Background concentrations are taken from <b>AIR QUALITY Table 3</b> .								
Source: (Roseville 2003a)								

## OPERATIONAL MODELING ANALYSIS

RE provided staff with a modeling analysis, using the ISCST3 model to quantify the potential impacts of the project for both turbines, during normal steady state operation and during start-up conditions. This modeling analysis consisted of a screening level and a refined level analysis. The screening level analysis tested basic operating conditions, which combined various load levels and duct burner operations with several ambient air temperatures. The refined modeling was developed from these screening level runs. The refined modeling impacts are shown in **AIR QUALITY Table 10**. The REP PM10 impacts could contribute to existing violations of the state 24-hour and annual average PM10 standards.

### Maximum Expected Impacts

The modeling assessment showed that the maximum one-hour air quality emission impacts from the facility would occur when the facility is at peak load and the auxiliary boiler is in operation. This is due to the fact that the auxiliary boiler, while fairly clean (burning natural gas), has a much lower stack than the combustion turbines. This lower stack generally results in less dispersion and thus higher emission impacts. Staff has included three other operating scenarios in **AIR QUALITY Table 10** because the maximum expected NO<sub>2</sub> emission impacts are very close to contributing to a new violation of the one-hour NO<sub>2</sub> ambient AAQS. The modeling results are high because the applicant has not used the ozone-limiting method (OLM) to refine the modeling results. Without using OLM, RE is assuming that all of the NO<sub>x</sub> (NO and NO<sub>2</sub>) emitted from the stack is converted into NO<sub>2</sub>. What actually occurs is that about 10 percent of the NO<sub>x</sub> emitted is emitted as NO<sub>2</sub>; the rest is NO. The NO emissions are converted to NO<sub>2</sub> by ambient ozone. OLM takes this fact into consideration and estimates the final NO<sub>2</sub> concentrations from the modeled NO<sub>x</sub> concentrations and the recorded ambient ozone concentrations. Thus, if RE chooses to use OLM, the final modeling results would be 10 percent to 20 percent of that currently shown in **AIR QUALITY Table 10**. Given the modeling results shown in **AIR QUALITY Table 10**, staff concludes that only the PM10 emissions are reasonably likely to contribute directly to an existing violation of the state PM10 (24-hour and annual) ambient air quality standards if left unmitigated, and that this impact is significant. For the other pollutants (NO<sub>2</sub>, CO and SO<sub>2</sub>), the project's emission impacts do not cause a new violation of the ambient standards, and thus, are not a significant impact.

**AIR QUALITY Table 10**  
**Maximum Predicted Operational Emission Air Quality Impacts**

Pollutants	Averaging Time	Direct Impacts (ug/m <sup>3</sup> )		Background (ug/m <sup>3</sup> )	Total Impacts (ug/m <sup>3</sup> )		Limiting Standard (ug/m <sup>3</sup> )	Total Impact as a Percentage of Standard	
		LM6000	GTX100		LM6000	GTX100		LM6000	GTX100
NO <sub>2</sub>	1-hour Peak Load with boiler	275.8	275.8	182.4	458.2	458.2	470	<b>97%</b>	<b>97%</b>
	1-hour Startup	117.0	129.8	182.4	299.4	312.2	470	64%	66%
	1-hour Peak Load	15.8	16.2	182.4	198.2	198.6	470	42%	42%
	1-hour Base load	7.77	10.23	182.4	190.2	192.6	470	40%	41%
	Annual	1.33	1.34	30.2	31.5	31.5	100	32%	32%
CO	1-hour	377.1	377.1	5,257	5,634	5,634	23,000	24%	24%
	8-hour	126.0	134.1	3,122	3,248	3,256	10,000	32%	33%
SO <sub>2</sub>	1-hour	49.9	49.9	49.8	69.7	69.7	655	11%	11%
	24-hour	2.33	2.33	28.7	31.0	31.0	365	9%	9%
	Annual	0.07	0.07	0.05	0.12	0.12	80	0%	0%
PM10	24-hour	16.7	16.7	62.0	78.7	78.7	50	<b>157%</b>	<b>157%</b>
	Annual	0.46	0.46	25.2	25.7	25.7	20	<b>128%</b>	<b>128%</b>

Notes:

Background concentrations are from **AIR QUALITY Table 3**.

NO<sub>2</sub> impacts assumption:

All 1-hour NO<sub>2</sub> impacts assume no ozone limiting method.

Both turbines in peak load operation and the auxiliary boiler on.

Both turbines in startup operation and the auxiliary boiler on.

Both turbines in peak load operation and the auxiliary boiler off.

Both turbines in base load operation and the auxiliary boiler off.

Source: (Roseville 2003a)

## **Secondary Pollutant Impacts**

The project's gaseous emissions of NO<sub>x</sub>, SO<sub>2</sub>, VOC and ammonia can contribute to the formation of secondary pollutants: ozone and PM10/PM2.5. There are air dispersion models that can be used to quantify ozone impacts, but they are used for regional planning efforts where hundreds or even thousands of sources are input into the modeling to determine ozone impacts. There are no regulatory agency models approved for assessing single source ozone impacts. However, because of the known relationship of NO<sub>x</sub> and VOC emissions to ozone formation, it can be said that the emissions of NO<sub>x</sub> and VOC from the REP do have the potential (if left unmitigated) to contribute to higher ozone levels in the region. These impacts would be significant because they would contribute to ongoing violations of the state and federal ozone ambient air quality standards.

Secondary PM10 formation, which is actually PM2.5, is the process of conversion from gaseous reactants to particulate products. The process of gas-to-particulate conversion is complex and depends on many factors, including local humidity and the presence of air pollutants. The basic process assumes that the SO<sub>x</sub> and NO<sub>x</sub> emissions are converted into sulfuric acid and nitric acid first, then reacted with ambient ammonia to form sulfate and nitrate. The sulfuric acid reacts with ammonia much faster than nitric acid and converts completely to particulate form. Nitric acid reacts with ammonia to form both a particulate and a gas phase of ammonium nitrate. The particulate phase will tend to fall out, however the gas phase can revert back to ammonia and nitric acid. Thus, under the right conditions, ammonium nitrate and nitric acid establish a balance of

concentrations in the ambient air. There are two conditions that are of interest, ammonia rich and ammonia poor. In the case of ammonia rich, there is more than enough ammonia to react with all the sulfuric acid and to establish a balance of nitric acid-ammonium nitrate. In the case of an ammonia limited environment, additional ammonia will tend to increase PM<sub>2.5</sub> concentrations.

Based on the estimates made by staff of the possible ammonia inventory of the District, staff assumes that the immediate environment for the REP facility is ammonia limited. Thus, the ammonia emissions from the REP stacks may increase ambient air PM<sub>2.5</sub> concentrations through the formation of ammonium sulfates and nitrates. There is insufficient information to determine how much this increase may be. However, the District is classified non-attainment for the state PM<sub>10</sub> and PM<sub>2.5</sub> ambient air quality standards. Thus, staff concludes that there is a reasonable likelihood that the ammonia emissions from the REP facility would contribute to existing violations of the PM<sub>10</sub> or PM<sub>2.5</sub> state ambient air quality standards if left unmitigated.

### **Visibility Impacts**

A visibility analysis of a project's gaseous emissions is required under the Federal Prevention of Significant Deterioration (PSD) permitting program; however, the REP does not trigger PSD review. The analysis would address the contributions of gaseous emissions (primarily NO<sub>x</sub>) and particulate (PM<sub>10</sub>) emissions to visibility impairment on the nearest Class 1 PSD areas, which are national parks and national wildlife refuges. There are no Class 1 PSD areas in the vicinity of the REP.

### **Greenhouse Gas Emissions Reporting**

In addition to regulated criteria pollutants, the combustion of natural gas produces air emissions known as greenhouse gases. These include primarily carbon dioxide and methane (unburned natural gas). Greenhouse gases are known to contribute to the warming of the earth's atmosphere. Climate change from rising temperatures represents a risk to California's economy, public health, and environment due to changes in sea levels that could lead to flooding of coastal communities, drought, forest fires, decline of fish populations, reduced hydropower opportunities, and loss of habitat. In 1998, the Energy Commission identified a range of strategies to prepare for an uncertain climate future, including a need to account for the environmental impacts associated with energy production, planning, and procurement (CEC 1998, p.5). In 2003, the Energy Commission recommended that the state should require reporting of greenhouse gas emissions as a condition of state licensing of new electric generating facilities (CEC 2003, p. 42). Staff recommends Condition of Certification **AQ-SC7** that requires the project owner to report the quantities of each greenhouse gas emitted as a result of facility operation. Such reporting would be done in accordance with accepted reporting protocol as specified.

### **Cumulative Impacts**

The staff assessment is required by CEQA to discuss the cumulative impacts of a project. Cumulative impacts refer to two or more individual impacts when, considered together, are considerable or increase other environmental impacts. A cumulative impact analysis must identify past, present, and reasonably foreseeable projects,

estimate the impact of these projects and recommend mitigation measures for those impacts found to be significant.

The Commission has developed a procedure for addressing cumulative impacts on air quality from power plant projects. Since the power plant air quality impacts can be reasonably estimated through air dispersion modeling (see Operational Modeling Analysis section) the project contributions to cumulative impacts can be estimated. To represent “past” and, to an extent, “present projects” that contribute to ambient air quality conditions, the Commission staff recommends the use of ambient air quality monitoring data (see Environmental Setting section), referred to as the “background”. The Commission has the following procedures to estimate what are additional appropriate “present projects” that are not represented in the background and “reasonably foreseeable projects”:

- First, the Commission staff (or the applicant) works with the air district to identify all projects that have submitted, within the last year of monitoring data, new application for an authority to construct (ATC) or permit to operate (PTO) and applications to modify an existing PTO within six miles of the project site. Beyond six miles, staff has determined through experience, there is very little chance for air emissions to interact directly. This effectively identifies all new emissions that emanate from a single point (e.g., a smoke stack), referred to as point sources. The Commission uses the submittal of an air district application as a reasonable demarcation of what is “reasonably foreseeable”. So, as an example, if the last year of ambient air quality monitoring data from area monitoring stations was 2003, then Commission staff (or the applicant) would ask the air district for all new applications that are not included in the ambient data.
- Second, the Commission staff (or the applicant) works with the air district and local counties to identify any new area sources within six miles of the project site. As opposed to point sources, area sources include sources like agricultural fields, residential developments or other such sources that do not have a distinct point of emission. New area sources are typically identified through draft or final Environmental Impact Reports (EIR) that are prepared for those sources. The Commission uses the initiation of the EIR process as the demarcation of “reasonably foreseeable” for new area sources.
- The data submitted, or generated from the applications with the air district for point sources or initiating the EIR process for area sources provides enough information to render these new emission sources in air dispersion modeling. Thus the next step is to review the available EIR(s) and permit application(s), determine what sources must be modeled and how they must be modeled. All sources are not modeled, for example a source that is emitting only VOC emissions will not be modeled (this actually occurred in one case, the source was physically modified to reduce NO<sub>x</sub>, but also increased VOC).
- Sources that are not new, but may not be represented in ambient air quality monitoring are also identified and included in the analysis. When these sources are included, it is typically a result of there being an existing source on the project site and the ambient air quality monitoring station being more than 2 miles away.

- When there are multiple sources, and we are primarily interested in the contributions of the project emissions with these other sources to these impacts, the modeling results are carefully interpreted so that they are not skewed towards smaller, high-impacting sources.

Once the modeling results are interpreted, they are added to the background and thus the modeling portion of the cumulative assessment is complete. Since this portion of the cumulative analysis is dependent on air dispersion modeling programs, the Commission staff requires that the applicant submit a modeling protocol prior to beginning the investigation of the sources to be modeled in the cumulative analysis. The modeling protocol is typically reviewed, commented on, and eventually approved in the Data Adequacy phase of the licensing procedure. It has been Commission policy to aid the applicant in finding sources (as described above), characterizing those sources and interpreting the results of the modeling. However, the actual modeling runs are traditionally left to the applicant to complete. There are several reasons for this; modeling analyses take time to perform and require significant expertise, the applicant has already performed a modeling analysis of the project alone (see Operational Modeling Analysis section), and the applicant can act on their own to modify their project as the results warrant. Once the cumulative project emission impacts are determined, the necessity to mitigate the project emissions can be evaluated, and the mitigation itself can be proposed or required (see Mitigation section).

The cumulative assessment for **REP** is not available at this time because RE has not yet submitted modeling results to the Commission. Staff reviewed and commented on the modeling protocols submitted by RE in their AFC (03-AFC-01). Staff concurred with RE that there were no new point sources within the six-mile radius that would require modeling. However, staff requested that RE to investigate the Environmental Impact Report (EIR) for the Western Roseville Specific Plan (WRSP) to determine if there were any industrial, commercial or residential sources assumed in that EIR that should be modeled. Additionally, staff directed RE to specifically identify the air quality related impacts that might have been over-ridden by the Placer County Board of Supervisors in the EIR for the WRSP. A local agency can allow what would be considered significant environmental impacts of a proposed project in an EIR in favor of other significant benefits that the project would bring to the community. While staff has no opinion as to this “over-riding” practice, staff believes that these impacts should be reviewed in the cumulative impacts analysis for REP.

Although staff is waiting for the cumulative analysis from RE, it is staff’s opinion that this analysis will not change staff’s conclusion regarding the REP. This is because staff is recommending full mitigation on all air quality criteria pollutants (NOx, CO, VOC, SOx and PM10) from REP.



## MITIGATION

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### APPLICANT'S PROPOSED MITIGATION

#### **Construction**

RE has proposed the following mitigation measures to control emissions during the construction phase of the proposed REP.

Fugitive Dust Control:

- Watering or chemical dust suppressant application on unpaved roads, wind erosion areas (disturbed by construction) or storage piles.
- Vacuum sweeping or water flushing of paved road surfaces to remove track-out.
- Covering or require two feet of freeboard for all trucks hauling soil, sand or other loose material.
- Using sandbags or other erosion control measures, to control run-off.
- Replanting vegetation as quickly as possible.
- Using wheel washing for all trucks leaving the construction site.

Construction Equipment Controls:

- Limiting engine idle time by shutting down when not in use.
- Performing regular preventive maintenance.
- Using low sulfur or low aromatic fuel meeting California standard for motor vehicle diesel fuel.
- Using low emitting gas and diesel engines meeting state and federal emission standards for construction equipment, including but not limited to catalytic converter systems and particulate filter systems.

#### **Operation**

The REP air pollutant emissions impacts will be reduced by using emission control equipment on the project and by providing emission offsets. To reduce NO<sub>x</sub> emissions, RE proposes to use dry-low NO<sub>x</sub> or water injection into the combustors in the CTGs and an SCR system with an ammonia injection grid.

To reduce CO emissions, RE proposes to use a combination of good combustion and maintenance practices, along with an oxidizing catalyst located in the HRSG. The use of a clean-burning fuel (natural gas) and the efficient combustion process of the CTGs will limit VOC and PM<sub>10</sub> emissions. The use of natural gas as the only fuel will limit SO<sub>2</sub> emissions.

## **Combustion Turbine**

### ***Water Injection***

Over the last 20 years, combustion turbine manufacturers have focused their attention on limiting the NO<sub>x</sub> formed during combustion. One method has been steam or water injected into the combustor cans to reduce combustion temperatures and the formation of thermal NO<sub>x</sub>, which is the primary source of NO<sub>x</sub> emissions from a CTG. This method has been employed for many years and is well understood. RE has proposed this pre-combustion control for the GE LM6000 CTGs.

### ***Dry Low-NO<sub>x</sub> Combustors***

Because of the expense and efficiency losses that result from steam or water injection, some CTG manufacturers are presently choosing to limit NO<sub>x</sub> formation through the use of dry low-NO<sub>x</sub> technologies. The Alstom version of the dry low-NO<sub>x</sub> combustor is a two stage ignition system. Initially the fuel/air mixture is ignited in two independent combustors and enters a premix stage (zero to 60 percent load). The low emissions are achieved from approximately 60 percent load on with the ignition of the center burner.

### ***Flue Gas Controls***

To further reduce the emissions from the combustion turbines before they are exhausted into the atmosphere, flue gas controls, primarily catalyst systems, will be installed in the HRSGs. RE is proposing two catalyst systems, an SCR system to reduce NO<sub>x</sub>, and an oxidizing system to reduce CO.

### ***Selective Catalytic Reduction (SCR)***

SCR refers to a process that chemically reduces NO<sub>x</sub> by injecting ammonia into the flue gas stream over a catalyst in the presence of oxygen.

The process is termed selective because the ammonia reducing agent preferentially reacts with NO<sub>x</sub> rather than oxygen, producing inert nitrogen and water vapor. The performance and effectiveness of SCR systems are related to operating temperatures, which may vary with catalyst designs. Flue gas temperatures from a combustion turbine typically range from 950° to 1100 °F.

Catalysts generally operate between 600° to 750 °F (ARB 1992), and are normally placed inside the HRSG where the flue gas temperature has cooled. At temperatures lower than 600 °F, the ammonia reaction rate may start to decline, resulting in increasing ammonia emissions, called “ammonia slip.” At temperatures above about 800°F, depending on the type of material used in the catalyst, damage to some catalysts can occur. The catalyst material most commonly used is titanium dioxide, but materials such as vanadium pentoxide, zeolite, or a noble metal are also used. These newer catalysts (versus the older alumina-based catalysts) are resistant to fuel sulfur fouling at temperatures below 770 °F (EPRI 1990).

Regardless of the type of catalyst used, efficient conversion of NO<sub>x</sub> to nitrogen and water vapor requires uniform mixing of ammonia into the exhaust gas stream. Also, the

catalyst surface has to be large enough to ensure sufficient time for the reaction to take place.

### ***Oxidizing Catalyst***

To reduce the turbine CO emissions, RE proposes to install an oxidizing catalyst, which is similar in concept to catalytic converters used in automobiles. The catalyst is usually coated with a noble metal, such as platinum, which will oxidize unburned hydrocarbons and CO to water vapor and carbon dioxide (CO<sub>2</sub>). The CO catalyst is proposed to limit the CO concentrations exiting the HRSG stack to four ppm, corrected to 15 percent excess oxygen and averaged over three-hours.

### **Emission Offsets**

To comply with the District Rule 502 and to offset the increased emissions from the REP, RE is proposing to surrender the following emission reduction credits (ERCs). These ERCs are summarized in **AIR QUALITY Table 11** with their values adjusted as indicated below.

#### ***District Certificate 2001-22***

This certificate constitutes 28.4 tons of PM<sub>10</sub> emission reduction from the shut down of an aggregate handling facility in 1996 located at 1800 Sunset Blvd, Rocklin (approximately seven miles from the REP site). The ERC value was calculated based on the U.S. EPA AP-42 (4<sup>th</sup> Edition) emission factors for all considered equipment and throughputs. The ERC is dominated by the control of fugitive dust emissions, for which the available water controls were being considered 90 percent effective. The consideration of reasonably available control technology (RACT) or best available retrofit control technology (BARCT) adjustments were not made at the time that the ERC was issued. The District has applied a distance-offset ratio of 1.3 per Rule 502.

#### ***District Certificate 2001-23***

This certificate constitutes 10.1 tons of NO<sub>x</sub> emission reduction from the 1993 shutdown of two wood-fired boilers at the Georgia Pacific lumber mill at 23901 Foresthill Road, Foresthill (approximately 25 miles from the REP site). The ERC value was calculated from source testing and averaged over two years of operation. The emissions were RACT/BARCT adjusted at the time of issuance, meaning that the emissions were reduced from their actual amounts to what they would have been if the recommended RACT/BARCT technology were applied. The District has applied a distance-offset ratio of 2.0 per Rule 502.

#### ***District Certificate 2001-24***

This certificate constitutes 29.4 tons of PM<sub>10</sub> emission reduction from the same shutdown as Certificate 2001-23 above. The PM<sub>10</sub> emissions were calculated from source testing on the wood-fired boilers (see above) which were controlled by centrifugal cyclone and by using AP-42 emission factors for the sawmill. The cyclone was considered RACT/BARCT at the time of issuance for the boilers and no further RACT/BARCT adjustment was made to the sawmill emissions. The District has applied a distance-offset ratio of 2.0 per Rule 502.

***District Certificate 2001-26***

This certificate constitutes 67.0 tons of VOC emission reductions from the same shutdown as Certificate 2001-23 above (wood-fired boilers only). RE is proposing to trade these VOC ERCs for a portion of the REP NOx emissions. The District has determined that a trading ratio of 2.6 (lbs VOC) to 1.0 (lbs NO<sub>2</sub>) is reasonable and consistent with other recent interpollutant trading ratios proposed. The most pertinent of the 10 projects considered is the Consumnes Power Plant Project which resulted in the same trading ratio. The District has also applied a distance-offset ratio of 2.0 per Rule 502.

***YSCAQMD Certificate EC-209 (re-issued as EC-238)***

This Yolo-Solano County Air Quality Management District (YSCAQMD) certificate constitutes 5.22 tons of NOx emission reductions from a 1993 shutdown of the Spreckles Sugar Company's beat pulp processing facility (aka, Delta Sugar Plant) located at the corner of River Rd and Willowpoint Rd, Clarksburg CA (approximately 35 miles from the REP site). Emissions were based on AP-42 emission factors for natural gas/wood waste fired dehydrator operations. BARCT adjustments were made to the original certificate in 1999 when the ERC was transferred and used by the Calpine Corp. The certificate was re-issued (to separate VOC and NO<sub>2</sub> ERCs) and has been transferred to the PCAPCD with a holdback of 10percent to be offered for sale in Yolo-Solano. The PCAPCD has applied a distance-offset ratio of 2.1 per Rule 502.

***YSCAQMD Certificate EC-210 (re-issued as EC-238)***

This YSCAQMD certificate constitutes 7.52 tons of NOx emission reductions from the Spreckles Sugar Company's facility described above. Emissions were based on AP-42 emission factors for coke-fired lime kiln operations; RACT/BARCT adjustments were not applied. The certificate was transferred to the PCAPCD with a holdback of 10 percent to be offered for sale in Yolo-Solano. The PCAPCD has applied a distance-offset ratio of 2.1 per Rule 502.

**AIR QUALITY Table 11**  
**Summary of Adjusted Emission Reduction Credits**

<b>Certificate</b>	<b>1<sup>st</sup> Quarter (lbs)</b>	<b>2<sup>nd</sup> Quarter (lbs)</b>	<b>3<sup>rd</sup> Quarter (lbs)</b>	<b>4<sup>th</sup> Quarter (lbs)</b>	<b>Annual (Tons)</b>
<b>NOx</b>					
2001-23	2,525	2,525	2,525	2,525	5.1
2001-26 <sup>a</sup>	6,445	6,445	6,445	6,445	12.9
EC-209 <sup>b</sup> (EC-238)	0	2,952	0	1,518	2.2
EC-210 <sup>b</sup>	0	4,551	0	1,892	3.2
<b>Total Adjusted NOx ERCs</b>	<b>8,970</b>	<b>16,473</b>	<b>8,970</b>	<b>12,379</b>	<b>23.4</b>
<b>PM10</b>					
2001-24	7,350	7,350	7,350	7,350	14.7
2001-22	1,983	17,125	12,373	12,243	21.9
<b>Total Adjusted PM10 ERCs</b>	<b>9,333</b>	<b>24,475</b>	<b>19,723</b>	<b>19,593</b>	<b>36.6</b>
Note: <sup>a</sup> The application of the trading ratio for Certificate 2001-26 has not been finalized at this time, these values represent CEC staff expectations of the District decisions. <sup>b</sup> Certificates EC-209 and EC-210 have only recently been transferred to the PCAPCD, these values represent CEC staff expectations of the District decisions.					

Source: (PCAPCD 2004a)

## **ADEQUACY OF PROPOSED MITIGATION**

### **Construction**

Staff finds that the mitigation proposed for fugitive dust control is reasonable and will mitigate the impacts from fugitive dust to the extent feasible. However, staff finds that there are further mitigation measures possible for the control of combustion emissions from construction equipment. These additional mitigation measures are discussed in the Staff Proposed Mitigation section below.

### **Operation**

#### **NOx Emission Reduction Credits**

Staff agrees with the findings by the District that the proposed emission control measures represent best available control technology (BACT) and that the REP facility is thus capable of operating under their proposed emission limits. However, staff finds that RE has not provided sufficient ERCs to fully comply with District Rule 502 for their current proposed emission limits. The NOx ERC deficiencies are shown in **AIR QUALITY Table 12**. However, these deficiencies are calculated by Energy Commission staff and should be more properly calculated by District staff, as these calculations are interpretations of District Rules and policies. It should also be noted that RE is currently investigating further offset opportunities.

**AIR QUALITY Table 12**  
**Summary of Deficiency of Proposed NOx ERCs to be Surrendered**

	<b>1<sup>st</sup> Quarter (lbs)</b>	<b>2<sup>nd</sup> Quarter (lbs)</b>	<b>3<sup>rd</sup> Quarter (lbs)</b>	<b>4<sup>th</sup> Quarter (lbs)</b>	<b>Annual (Tons)</b>
Facility Offset Requirement Alstom GTX100	19,215	18,911	20,429	20,541	39.55
Total NOx ERCs Proposed	8,970	16,473	8,970	12,379	23.4
<b>Deficiency for GTX100</b>	<b>10,245</b>	<b>2,438</b>	<b>11,459</b>	<b>8,162</b>	<b>16.15</b>
Facility Offset Requirement GE LM6000	17,857	16,015	19,357	19,243	36.24
Total NOx ERCs Proposed	8,970	16,473	8,970	12,379	23.4
<b>Deficiency for LM6000</b>	<b>8,887</b>	<b>-458</b>	<b>10,387</b>	<b>6,864</b>	<b>12.84</b>
Note: The negative 458 lbs NOx ERCs "deficiency " shown in the 2 <sup>nd</sup> quarter for the LM6000 configuration indicates that RE has sufficient ERCs for that quarter for that configuration. Facility offset requirements are as reported by the PCAPCD in the May 25, 2004 PDOC.					

### **PM10 Emission Reduction Credits**

The REP is deficient for PM10 ERCs in the first quarter, but there are more than enough excess PM10 ERCs in the second quarter that can be credited to the first quarter (via District Rules) to satisfy the offset requirements for PM10. However, the PM10 ERCs being proposed may have a considerable portion of the emission reductions contributed from dust sources, rather than combustion sources. The PM10 emissions that are to be emitted from REP are primarily PM2.5. Given that the District is proposed to be a non-attainment area for the state annual PM2.5 ambient air quality standard, staff strongly recommends that PM10 ERCs from exclusively combustion emission sources be given preference.

### **VOC, CO & SOx Emission Reductions**

The REP does not trigger the District Rule 502 offset requirements for VOC, SOx or CO emissions. While these pollutants will not cause a direct impact, VOC and SOx emissions can contribute to downwind ozone and PM2.5 formation respectively. While RE is investigating further offset strategies, they are not proposing to mitigate the REP VOC and SOx emissions at this time.

## **STAFF PROPOSED MITIGATION**

### **Construction**

In addition to the mitigation measures proposed by RE, staff proposes the following mitigation measures that have become standard in staff recommended construction mitigation. It has been staff's experience that these measures are effective mitigation and do not represent a significant burden to the applicant. With these additional mitigation measures, staff is reasonably confident that the REP construction emission impacts will be mitigated to a level of insignificance.

- All diesel-fueled engines used in the construction of the facility shall be fueled with ultra-low sulfur diesel, which contains no more than 15 ppm sulfur.

- Diesel-fueled construction equipment will meet the Tier 1 California Emission Standards for Off-Road Compression-Ignition Engines or better, or will employ suitable catalyzed diesel particulate filters.
- All construction equipment will not remain running at idle for more than five minutes.

Additionally, the District has proposed construction conditions (PCAPCD 2004a) that are standard when the District is lead agency in the CEQA review process and these conditions are included in the West Roseville Specific Development Plan. Since these conditions are not tied to any District rule or regulation, the District has requested that the Commission consider adopting them in the REP case. In reviewing the conditions, staff finds that they are very similar to the construction conditions that the Commission currently uses on all power plants licensing cases (see Conditions of Certification AQ-SC1 through 5). There are two conditions that the District has proposed that the Commission does not currently require.

The District proposes that RE reduce the construction fleet-average NOx emissions by 20 percent and the particulate emissions by 45 percent as compared to the most recent CARB fleet average (the fleet is to consist of all heavy duty equipment 50 bhp or greater). Staff will investigate this condition further, but believes that this is achievable by reasonably restricting construction equipment to CARB Tier 1 (1996 or newer) engines.

The District also proposes to allow RE to use emulsified diesel fuel (a mixture of diesel and water) to reduce NOx emissions in order to attain the 20 percent emission reduction discussed above. There may possibly be warranty, compatibility and availability issues with the use of emulsified diesel. However, staff will investigate the possibility of making emulsified diesel an available mitigation measure to the applicant.

## **Operation**

### **Federally Enforceable Limitation**

As discussed above, RE is investigating opportunities for obtaining further offsets for the REP. As currently proposed, RE has not offered sufficient ERCs to offset the REP emissions. Thus, there are remaining unmitigated significant impacts. Specifically, unmitigated NOx and VOC emissions that could contribute to ozone violations and unmitigated SOx emissions that could contribute to PM10/PM2.5 violations. Staff considers a contribution to an existing violation of the state or federal ambient air quality standards to be significant if left unmitigated.

If RE is unable to provide sufficient offsets, the project may still be built and operated if it is willing to accept a federally enforceable operational constraint that would restrict emissions on a quarterly basis equivalent to the ERCs presently secured (as shown in **AIR QUALITY Table 11**). Such a constraint could be removed later if RE is able to provide the required offsets. REP could accomplish this in two basic approaches: operate both turbines significantly less than currently proposed or shut one turbine down and operate the other slightly less than currently proposed.

## **VOC and SOx Emission Mitigation**

RE is not proposing to offset or mitigate the REP emissions of VOC or SOx. These emissions are considered precursors to ozone and PM10/PM2.5 downwind formation, respectively. The PCAPCD is non-attainment for the federal ozone ambient air quality standards (both 1-hour and 8-hour) and is in non-attainment for the state PM10 ambient air quality standards (24-hour and annual). Since the ambient air quality is all ready in violation for ozone and PM10, and the release of VOC and SOx will likely contribute to further violations, staff recommends that these emissions be mitigated.

RE is currently seeking further NOx offsets at a local rail yard to comply with District Rule 502 (PCAPCD 2004a). RE has several barriers that must be overcome to be successful. However, if they are successful and are able to develop NOx ERCs in the quantity necessary to complete the offset requirements, it is very likely that they will also develop more than enough VOC and SOx reductions to satisfy staff's recommended mitigation requirements.

## **Ammonia Slip Mitigation**

RE has chosen to comply with BACT by using an ammonia injected SCR system. However, they have also proposed to be limited to an ammonia slip rate of no more than 10-ppm @ 15 percent O<sub>2</sub> averaged over one-hour, rather than the five-ppm @ 15 percent O<sub>2</sub> averaged over three-hours level that staff recommends.

As has been discussed, the District is (or is recommended to be) in non-attainment for both PM10 and PM2.5 state ambient air quality standards. Staff also reasonably concluded that the District is most likely an ammonia limited area, such that emitting additional ammonia is likely to lead to further PM2.5 formation. Thus, it is staff's position that the release of ammonia from the REP facility may contribute to further violations of the PM10/PM2.5 state ambient air quality standards.

RE is proposing an ammonia slip limit of 10 ppm @ 15 percent O<sub>2</sub>. Staff has demonstrated in testimony that an ammonia slip limit of five ppm @ 15 percent O<sub>2</sub> would pose no significant financial or technical burden to RE. To reduce the likelihood of a significant impact from excessive ammonia slip, staff recommends that the REP ammonia slip be limited to no more than five ppm @ 15 percent O<sub>2</sub> averaged over three hours.

In staff's experience it is not technically prohibitive or infeasible to limit ammonia slip to five-ppm. In fact, the South Coast Air Quality Management District, a recognized progressive leader among air districts, has been requiring five-ppm ammonia slip over the past two years as part of their BACT/LAER requirements. The South Coast AQMD proposed this rule change based, in part, on the CARB Guidance Document (9/99) that recommended that air districts establish a health protective ammonia slip limit at or below five-ppm for combined cycle power plants. In fact, the recent Malburg Generation Station (Vernon City), licensed by the Commission, proposed a five-ppm ammonia slip limit for their GTX100 combined cycle power plant, a two on one design (two CTGs on one steam turbine) that is very similar to the REP proposal.



## **District Proposed CEQA Mitigation**

Additionally, the District has proposed operational conditions (PCAPCD 2004a) that are standard when the District is the CEQA lead agency and these conditions are included in the West Roseville Specific Development Plan. Since these conditions are not tied to any District rule or regulation, the District has requested that the Commission consider adopting them as the CEQA lead agency in the REP case. Staff is currently investigating the following District recommended measures:

- Landscape with native drought-resistant species (plants, trees and bushes) to reduce the demand for gas powered landscape maintenance equipment.
- All truck loading and unloading docks shall be equipped with one 110/208 volt power outlet for every two dock doors. Diesel trucks shall be prohibited from idling more than five minutes and must be required to connect to the 110/208 volt power to run any auxiliary equipment. Signage shall be provided.
- HVAC units shall be equipped with PremAir (or other manufacturer) catalyst system if available and economically feasible at the time building permits are issued. The PremAir catalyst can convert up to 70percent of ground level ozone that passes over the condenser coils into oxygen. The PremAir system is considered feasible if the additional cost is less than 10 percent of the base HVAC unit.
- The roads and parking areas at the plant shall be paved.
- Off road equipment such as forklifts shall utilize electric or propane for drive power whenever possible.

## **COMPLIANCE WITH LORS**

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### **FEDERAL**

As discussed earlier the PSD requirements apply only to projects that exceed 100 tons per year for any pollutant (known as major sources). Since, REP's emissions do not exceed 100 tons per year for any criteria pollutant the project is not subject to PSD permitting requirements.

### **STATE**

RE will demonstrate that the REP will comply with Section 41700 of the California State Health and Safety Code with the District Final Determination of Compliance.

### **LOCAL**

Compliance with specific District rules and regulations are discussed in the Preliminary Determination of Compliance (PCAPCD 2004a). RE has not yet demonstrated their ability to comply with District Rule 502 by providing adequate offsets for the REP as proposed.

## CONCLUSIONS AND RECOMMENDATIONS

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Staff has found that the REP operational emissions of NO<sub>x</sub> do not have the potential to cause a direct impact on the state or federal NO<sub>2</sub> ambient air quality standards or to act as a precursor to the downwind formation of secondary PM<sub>10</sub>/PM<sub>2.5</sub>. However, staff also finds that the REP operational emissions of NO<sub>x</sub> have the potential, if left unmitigated, to cause or contribute to an impact on the state and federal ambient air quality ozone standards as a precursor to the downwind formation of ozone. Therefore, staff concludes that the REP operational emissions of NO<sub>x</sub>, if left unmitigated, have the potential to cause a significant ambient air quality impact. RE will reduce emissions by providing ERCs for NO<sub>x</sub> emissions, and thus reduce the potential for ozone formation. However, the current amounts of offsets proposed are insufficient to mitigate the project NO<sub>x</sub> emissions, as proposed, to a level of insignificance. To comply with District Rule 502, RE must secure an additional 16.15 tons/year of NO<sub>x</sub> ERCs.

Staff has found that the REP operational emissions of SO<sub>x</sub> will not cause or contribute to a violation of any of the SO<sub>2</sub> state or federal ambient air quality standards. However, staff has found that the REP operational emissions of SO<sub>x</sub>, if left unmitigated, may contribute to the downwind formation of secondary PM<sub>10</sub>/PM<sub>2.5</sub> ambient air quality impacts. RE is not proposing to mitigate the REP operational SO<sub>x</sub> emission ambient air quality impacts, thus staff finds these ambient air quality impacts to be significant if left unmitigated.

Staff has found that the REP operational emissions of VOC may contribute to the downwind formation of ozone and thus cause or contribute to ongoing violations of the state and federal ozone ambient air quality standards. RE is not proposing to mitigate the REP operational VOC emission ambient air quality impacts, thus staff finds these ambient air quality impacts to be significant if left unmitigated.

RE is investigating further NO<sub>x</sub> offset sources within the local rail yard. If an adequate source of NO<sub>x</sub> offsets is developed from this emission source, staff is confident that sufficient SO<sub>x</sub> and VOC emission reductions will be developed to mitigate the REP SO<sub>x</sub> and VOC ambient air quality impacts to a level of insignificance.

Staff has found the REP operational PM<sub>10</sub>/PM<sub>2.5</sub> emissions, if left unmitigated, may contribute to existing PM<sub>10</sub>/PM<sub>2.5</sub> violations of the state PM<sub>10</sub> and PM<sub>2.5</sub> ambient air quality standards. RE has provided sufficient PM<sub>10</sub> ERCs to comply with District rules; however, staff finds that these ERCs are based primarily on reductions of fugitive dust (consisting of course, fine and ultra fine particles) and not combustion sources (primarily ultra fine particles only). Therefore, staff strongly recommends that PM<sub>10</sub> ERCs based on combustion source reductions be given preference. Alternatively the proposed ERCs could be divided into course (PM), fine (PM<sub>10</sub>) and ultra fine (PM<sub>2.5</sub>) fractions and the ultra fine portion only applied to the REP as emission reductions. This alternative would ultimately require RE seek further PM<sub>10</sub> offsets.

RE is proposing an ammonia slip limit of 10 ppm @ 15 percent O<sub>2</sub>, when five ppm @ 15 percent O<sub>2</sub> would pose no significant financial or technical burden. To reduce the likelihood of a significant impact from excessive ammonia slip, staff recommends that

the REP ammonia slip be limited to no more than five ppm @ 15 percent O<sub>2</sub> averaged over three hours.

Finally, RE has not yet provided the cumulative impact assessment for air quality. In the Final Staff Assessment, staff will provide the results of the cumulative impact assessment as well as the environmental justice impact assessment. Given that the cumulative impact assessment is not complete, that there is a significant short fall of NO<sub>x</sub> ERCs for offsetting purposes, that this short fall is in non-compliance with District rules and that the VOC and SO<sub>x</sub> emissions remain unmitigated, air quality staff cannot recommend the Roseville Energy Park project for approval at this time.

## **CONDITIONS OF CERTIFICATION**

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### **COMMISSION STAFF RECOMMENDED CONDITIONS**

**AQ-SC1** The project owner shall designate and retain an on-site Air Quality Construction Mitigation Manager (AQCMM) who shall be responsible for directing and documenting compliance with conditions AQ-SC3 and AQ-SC4 for the entire project site and linear facility construction. The on-site AQCMM may delegate responsibilities to one or more air quality construction mitigation monitors. The AQCMM shall have full access to areas of construction of the project site and linear facilities, and shall have the authority to appeal to the CPM to have the CPM stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM may have other responsibilities in addition to those described in this condition. The AQCMM shall not be terminated without written consent of the CPM.

**Verification:** At least 60 days prior to the start of ground disturbance, the project owner shall submit to the CPM for approval, the name, resume, qualifications, and contact information for the on-site AQCMM and any air quality construction mitigation monitors. The AQCMM and all delegated monitors must be approved by the CPM before the start of ground disturbance.

**AQ-SC2** The project owner shall provide an Air Quality Construction Mitigation Plan (AQCMP), for approval, which details the steps that will be taken and the reporting requirements necessary to ensure compliance with conditions AQ-SC3 and AQ-SC4.

**Verification:** At least 60 days prior to the start of any ground disturbance, the project owner shall submit the AQCMP to the CPM for approval. The CPM will notify the project owner of any necessary modifications to the plan within 30 days from the date of receipt.

**AQ-SC3** The AQCMM shall submit to the CPM, in the Monthly Compliance Report (MCR), a construction mitigation report that demonstrates compliance with the following mitigation measures for the purposes of preventing fugitive dust plumes from leaving the Project site and controlling other construction-related emissions. Any deviation from the following mitigation measures shall require prior CPM notification and approval.

- a) All unpaved roads and disturbed areas in the project and linear construction sites shall be watered as frequently as necessary to comply with the dust mitigation objectives of AQ-SC4 (the prevention of fugitive dust plumes). The frequency of watering can be reduced or eliminated during periods of precipitation.
- b) No vehicle shall exceed 10 miles per hour within the construction site.
- c) The construction site entrances shall be posted with visible speed limit signs.
- d) All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.
- e) Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.
- f) All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.
- g) All construction vehicles shall enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the CPM.
- h) Construction areas adjacent to any paved roadway shall be provided with sandbags or other measures as specified in the Storm Water Pollution Prevention Plan to prevent run-off to roadways.
- i) All paved roads within the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.
- j) At least the first 500 feet of any public roadway exiting from the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff from the construction site is visible on the public roadways.
- k) All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered, or shall be treated with appropriate dust suppressant compounds.
- l) All vehicles that are used to transport solid bulk material on public roadways and that have potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least one foot of freeboard.
- m) Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

n) Diesel-Fueled Engines

- (1) All diesel-fueled engines used in the construction of the facility shall be fueled only with ultra-low sulfur diesel, which contains no more than 15 ppm sulfur.
- (2) All diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCMM showing that the engine meets the conditions set forth herein.
- (3) All construction diesel engines, which have a rating of 100 hp or more, shall meet, at a minimum, the Tier 1 California Emission Standards for Off-Road Compression-Ignition Engines as specified in California Code of Regulations, Title 13, section 2423(b)(1) unless certified by the on-site AQCMM that such engine is not available for a particular item of equipment. In the event a Tier 1 engine is not available for any off-road engine larger than 100 hp, that engine shall be equipped with a catalyzed diesel particulate filter (soot filter), unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this condition, the use of such devices is "not practical" if, among other reasons:
  - a. There is no available soot filter that has been certified by either the California Air Resources Board or U.S. Environmental Protection Agency for the engine in question; or
  - b. The construction equipment is intended to be on-site for ten (10) days or less.

The CPM may grant relief from this requirement if the AQCMM can demonstrate that they have made a good faith effort to comply with this requirement and that compliance is not possible.

The use of a soot filter may be terminated immediately if one of the following conditions exists, provided that the CPM is informed within ten (10) working days of the termination:

- a. The use of the soot filter is excessively reducing normal availability of the construction equipment due to increased downtime for maintenance, and/or reduced power output due to an excessive increase in backpressure.
  - b. The soot filter is causing or is reasonably expected to cause significant engine damage.
  - c. The soot filter is causing or is reasonably expected to cause a significant risk to workers or the public.
  - d. Any other seriously detrimental cause which has the approval of the CPM prior to the termination being implemented.
- (4) All heavy earthmoving equipment and heavy duty construction related trucks with engines meeting the requirements of (n)(3) above shall be properly maintained and the engines tuned to the engine manufacturer's specifications.

- (5) All heavy construction equipment with engines meeting the requirements of (n)(3) above shall not remain running at idle for more than five minutes, to the extent practical.

**Verification:** The project owner shall include in the MCR (1) a summary of all actions taken to maintain compliance with this condition, (2) copies of all diesel fuel purchase records, (3) copies of any complaints filed with the air district in relation to project construction, (4) a list of all heavy equipment used on site during that month, including the owner of that equipment and a letter from each owner indicating that equipment has been properly maintained, and (5) any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

**AQ-SC4** The AQCMM shall continuously monitor the construction activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported (1) off the project site or (2) 200 feet beyond the centerline of the construction of linear facilities or (3) within 100 feet upwind of any regularly occupied structures not owned by the project owner indicate that existing mitigation measures are not resulting in effective mitigation. The AQCMM shall implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed:

Step 1: The AQCMM shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

Step 2: The AQCMM shall direct implementation of additional methods of dust suppression if step 1 specified above fails to result in adequate mitigation within 30 minutes of the original determination.

Step 3: The AQCMM shall direct a temporary shutdown of the activity causing the emissions if step 2 specified above fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The owner/operator may appeal to the CPM any directive from the AQCMM to shut down an activity, provided that the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM before that time.

**Verification:** The AQCMP shall include a section in the monthly compliance report detailing all observances by the AQCMP and mitigation actions taken.

**AQ-SC5** The project owner shall submit to the CPM for review and approval any modification proposed by the project owner to any project air permit. The project owner shall submit to the CPM any modification to any permit proposed by the District or U.S. EPA, and any revised permit issued by the District or U.S. EPA, for the project.

**Verification:** The project owner shall submit any proposed air permit modification to the CPM within five working days of its submittal either by 1) the project owner to an

agency, or 2) receipt of proposed modifications from an agency. The project owner shall submit all modified air permits to the CPM within 15 days of receipt.

**AQ-SC6** The project owner shall maintain records of fuel use, emission and operational data sufficient to demonstrate compliance with the Conditions of Certification referenced herein.

**Verification:** The project owner shall submit to the CPM Quarterly Air Quality Reports no later than 30 days after the end of each calendar quarter.

**AQ-SC7** The project owner shall report to the CPM the quantities of each greenhouse gas (GHG) emitted on an quarterly basis as a result of facility operation. GHG emissions shall be reported as equivalent CO<sub>2</sub> pounds. The identification of each GHG and the method to estimate CO<sub>2</sub> equivalent emissions shall conform to the California Climate Action Registry General Reporting Protocol for power plants.

**Verification:** GHG emissions shall be reported to the CPM as part of the Quarterly Air Quality Reports required by Condition of Certification AQ-SC6.

## SPECIFIC FACILITY CONDITIONS

### Offsets

**AQ-1** If the GE LM-6000 turbines are selected, emission offsets shall be provided for all calendar quarters for NO<sub>x</sub> and PM-10 in the following amounts, at the offset ratio specified in the Condition of Certification AQ-5. (Offsets are not required for CO, SO<sub>x</sub> and VOC emissions.)

GE LM6000 - OFFSETS REQUIRED					
POLLUTANT	QUARTER 1 (lbs/quarter)	QUARTER 2 (lbs/quarter)	QUARTER 3 (lbs/quarter)	QUARTER 4 (lbs/quarter)	Tons/year
NO <sub>x</sub>	17,857	16,015	19,357	19,243	36.24
PM-10	17,523	15,246	18,999	18,788	35.28

**Verification:** The project owner shall submit to the CPM documentation from the PCAPCD showing that all ERCs identified in Condition of Certification AQ-12 have been surrendered prior to the commencement of construction.

**AQ-2** If the Alstom GX100 turbines are selected, emission offsets shall be provided for all calendar quarters for NO<sub>x</sub> and PM-10 in the following amounts, at the offset ratio specified in the Condition of Certification AQ-5. (Offsets are not required for CO, SO<sub>x</sub> and VOC emissions.)

ALSTOM GX100 - OFFSETS REQUIRED					
POLLUTANT	QUARTER 1 (lbs/quarter)	QUARTER 2 (lbs/quarter)	QUARTER 3 (lbs/quarter)	QUARTER 4 (lbs/quarter)	Tons/year
NOx	19,215	18,911	20,429	20,541	39.55
PM-10	17,854	15,513	19,378	19,158	35.95

**Verification:** The project owner shall submit to the CPM documentation from the PCAPCD showing that all ERCs identified in Condition of Certification AQ-12 have been surrendered prior to the commencement of construction.

**AQ-3** NOx and VOC emission reductions that occurred during calendar quarter 2, beginning April 1, and calendar quarter 3, beginning July, 1 may be used to offset increases in NOx and VOC during any quarter of the year.

**Verification:** The project owner shall notify the CPM in writing of any proposal to make such trading within 30 days following of the trade being approved by the PCAPCD.

**AQ-4** PM-10 emission reductions that occurred during calendar quarter 1, beginning January 1, and calendar quarter 3, beginning October 1, may be used to offset increases in PM-10 during any quarter of the year.

**Verification:** The project owner shall notify the CPM in writing of any proposal to make such trading within 30 days following of the trade being approved by the PCAPCD.

**AQ-5** The applicant shall provide offsets according to the offset ratios shown in the following table. These ratios are listed in the current Rule 502, New Source Review (8/09/01) with the exception of the ratio for non-attainment pollutants within 15 mile radius and within the PCAPCD. The U.S. EPA requires a minimum offset ratio of 1.3 for non-attainment pollutants.

Location of Offset	NOx and PM-10 Offset Ratios
Within 15-Mile Radius and within the PCAPCD	1.3 to 1.0
Within 15-Mile Radius, outside the PCAPCD, but within the same air basin	1.3 to 1.0
Greater than 15-Mile but within 50-Mile Radius and within PCAPCD	2.0 to 1.0
Greater than 15-Mile but within 50-Mile Radius and outside the PCAPCD, but within the same air basin	2.1 to 1.0
More than 50-Mile Radius and within the same air basin	2.2 to 1.0



**Verification:** The project owner shall submit to the CPM documentation from the PCAPCD showing that all ERCs identified in Condition of Certification AQ-12 have been surrendered prior to the commencement of construction.

**AQ-6** VOC emissions proposed to be traded for NO<sub>x</sub> will need to be further adjusted by an interpollutant trading ratio. The project owner has proposed a ratio of 2.6. The offset ratio for the VOC for NO<sub>x</sub> trading is 2.0. The overall ratio of 5.2 to 1 is higher than used on other power plant projects. Additional modeling will be required to make a final determination of the trading ratio unless EPA concurs that a 5.2 overall ratio is acceptable.

**Verification:** The project owner shall submit to the CPM all further modeling assessments and associated analysis as required by the PCAPCD and EPA for review and approval prior to initiating construction activities.

**AQ-7** Offsets shall only come from regions with the same air quality designations or worse designations than that of the emissions unit or stationary source requiring the offsets.

**Verification:** The project owner shall submit to the CPM documentation from the PCAPCD showing that all ERCs identified in Condition of Certification AQ-12 have been surrendered prior to the commencement of construction and shall include each area designation of their origins for all ambient air quality standards both state and federal.

**AQ-8** Prior to the final determination of compliance, for ERCs credited to a stationary source located in another air district than PCAPCD, the governing board of the district where the emission reductions are credited shall approve by a resolution the crediting of the emission offsets for use in PCAPCD.

**Verification:** The project owner shall submit to the CPM documentation from the PCAPCD showing that all ERCs identified in Condition of Certification AQ-12 have been surrendered prior to the commencement of construction and shall include all Board resolutions as is required by this condition.

**AQ-9** Prior to the final determination of compliance, the project owner shall appear before the PCAPCD District Board and gain approval by a resolution of ERCs that were credited to a stationary source located in another air district.

**Verification:** The project owner shall submit to the CPM documentation from the PCAPCD showing that all ERCs identified in Condition of Certification AQ-12 have been surrendered prior to the commencement of construction and shall include all Board resolutions as is required by this condition.

**AQ-10** The project owner must demonstrate by written documentation that all necessary offsets have been acquired or that binding contracts to secure such offsets have been entered into prior to the final determination of compliance.

**Verification:** The project owner shall submit to the CPM all written documentation and binding contracts demonstrating compliance with this condition prior to the issuance of the final determination of compliance.

**AQ-11** All required ERC certificates shall be submitted to the PCAPCD at least 30 days prior to start of construction. Copies shall be submitted to the Energy Commission CPM by that date.

**Verification:** The project owner shall submit to the CPM documentation from the PCAPCD showing that all ERCs identified in Condition of Certification AQ-12 have been surrendered prior to the commencement of construction.

**AQ-12** In addition to additional offsets which are required, the ERC certificates to be surrendered shall include the following ERCs which have been identified for offsets for this project:

ERCs Currently Identified						
<b>NOx</b>	District/ Certificate #	Quarter 1 (lbs)	Quarter 2 (lbs)	Quarter 3 (lbs)	Quarter 4 (lbs)	Annual (Tons)
Enron North America	PCAPCD/ 2001-23	<b>5,050</b>	<b>5,050</b>	<b>5,050</b>	<b>5,050</b>	10.1
Calpine Corp.	YSAQMD/ EC-209 (EC-238)	<b>0</b>	<b>6,888</b>	<b>0</b>	<b>3,542</b>	5.22
Calpine Corp.	YSAQMD/ EC-210	<b>0</b>	<b>10,620</b>	<b>0</b>	<b>4,414</b>	7.52
<b>NOx</b>	<b>Totals</b>	<b>5,050</b>	<b>22,558</b>	<b>5,050</b>	<b>13,006</b>	<b>22.8</b>
VOCs for NOx	District/ Certificate #	Quarter 1 (lbs)	Quarter 2 (lbs)	Quarter 3 (lbs)	Quarter 4 (lbs)	Annual (Tons)
Enron North America	PCAPCD/ 2001-26	<b>33,512</b>	<b>33,512</b>	<b>33,512</b>	<b>33,512</b>	67.0
<b>VOCs for NOx</b>	<b>TOTALS</b>	<b>33,512</b>	<b>33,512</b>	<b>33,512</b>	<b>33,512</b>	<b>67.0</b>
<b>PM-10</b>	District/ Certificate #	Quarter 1 (lbs)	Quarter 2 (lbs)	Quarter 3 (lbs)	Quarter 4 (lbs)	Annual (Tons)
Enron North America	PCAPCD/ 2001-24	<b>14,700</b>	<b>14,700</b>	<b>14,700</b>	<b>14,700</b>	29.4
Enron North America	PCAPCD/ 2001-22	2,578	22,263	16,085	15,916	28.4
<b>PM-10</b>	<b>TOTALS</b>	<b>17,278</b>	<b>36,963</b>	<b>30,785</b>	<b>30,616</b>	<b>57.8</b>

**Verification:** The project owner shall submit to the CPM documentation from the PCAPCD showing that all ERCs identified in this Condition have been surrendered prior to the commencement of construction.

**AQ-13** The gas turbines and auxiliary boiler shall be fired exclusively on pipeline grade natural gas.

**Verification:** The project owner shall submit to the CPM a written statement from a California registered Professional Engineer stating that said engineer has reviewed the as-built-designs or personally inspected the identified equipment and verifies that said equipment is plumbed exclusively for natural gas combustion.

**AQ-14** The project owner shall maintain an Operating Compliance Plan for the new CTG/HRSG which will assure that the air pollution control equipment will be properly maintained and that necessary operational procedures are in place to continuously achieve compliance with this permit. The Operating Compliance Plan shall include a description of the process monitoring program and devices to be provided.

- A. The plan shall specify the frequency of surveillance checks that will be made of process monitoring devices and indicators to determine continued operation within permit limits. A record or log of individual surveillance checks shall be kept to document performance of the surveillance.
- B. The plan shall include the frequency and methods of calibrating the process monitoring devices.
- C. The plan shall specify for each emission control device:
  - i. Operation and maintenance procedures that will demonstrate continuous operation of the emission control device during emission-producing operations; and
  - ii. Records that must be kept to document the performance of required periodic maintenance procedures.
- D. The plan shall identify what records will be kept to comply with air pollution control requirements and regulations and the specific format of the records. These records shall include at least the Recordkeeping information required by this permit. The information must include emission monitoring evaluations, calibration checks and adjustments, and maintenance performed on such monitoring systems.
- E. The plan shall be submitted to the PCAPCD and the CPM 30 days prior to startup of the gas turbines and boiler. The plan must be implemented upon approval by the Air Pollution Control Officer.
- F. The plan shall be resubmitted to the PCAPCD for approval upon any changes to compliance procedures described in the plan, or upon the request of the Air Pollution Control Officer.

**Verification:** The project owner shall submit the Operating Compliance Plan to the PCAPCD and the CPM 30 days prior to startup of the gas turbines and boiler for PCAPCD approval. The project owner shall resubmit the Operating Compliance Plan to the PCAPCD and the CPM for PCAPCD approval upon any changes to compliance procedures described in the plan, or upon the request of the Air Pollution Control Officer.

**AQ-15** Continuous Emission Monitoring System Remote Polling:

- A. The project owner shall install and maintain equipment, facilities, software and systems at the facility and at the PCAPCD office that will allow the PCAPCD to poll or receive electronic data from the CEMS. The project owner shall make CEMS data available for automatic polling of the daily records. The project owner shall make hourly records available for manual polling within no more than a one hour delay. The basic elements of this equipment include a telephone line, modem and datalogger. Alternatively, an internet based system may be used. The costs of installing and operating this equipment, excluding PCAPCD costs, shall be borne by the REP.
- B. Upon notice by the PCAPCD that the facility's polling system is not operating, the REP shall provide the data by a PCAPCD-approved alternative format and method for up to a maximum of 30 days.
- C. The polling data is not a substitute for other required recordkeeping or reporting. (Rule 404 § C; Rule 501 § 304.2.c; HSC 42706)

**Verification:** The project owner shall submit to the CPM a written statement from a California registered Professional Engineer stating that said engineer has reviewed the as-build-designs or inspected the equipment identified and certifies its proper operation with the PCAPCD requirement and specifications no more than 180 days following the cessation of the commissioning period.

### **Operating Limitations**

**AQ-16** The hours of operation of each gas turbines shall not exceed the following:

<b>Power Plant Gas Turbine Operating Schedule</b>					
	<b>1<sup>st</sup></b>	<b>2<sup>nd</sup></b>	<b>3<sup>rd</sup></b>	<b>4<sup>th</sup></b>	<b>Annual</b>
Total operating hours	2,096	1,864	2,132	2,145	8,237

**Verification:** The project owner shall include all operational data identified in this condition as part of the Quarterly Air Quality Report required by Condition of Certification AQ-SC6.

**AQ-17** The project owner shall submit design details for the selective catalytic reduction, oxidation catalyst, and continuous emission monitor system to the PCAPCD and the CPM prior to commencement of construction of these components.

**Verification:** The project owner shall submit the designs identified in this condition to the PCAPCD and the CPM at least 30 days prior to commencement of construction of the identified components.

**AQ-18** The project owner shall install a selective catalytic reduction (SCR) system and an oxidation catalyst on the gas turbine. The SCR and oxidation catalyst equipment shall be operated whenever the gas turbine is operated.

**Verification:** The project owner shall submit to the CPM a written statement by a California registered Professional Engineer stating that said engineer has reviewed the as-built-designs or inspected the identified equipment and certifies that it is operational and air tight. The project owner shall include the operational status of the SCR and oxidation catalyst during all hours of operation as part of the Quarterly Air Quality Report required by Condition of Certification AQ-SC6.

**AQ-19** The gas turbine engine and generator lube oil vents shall be equipped with mist eliminators.

**Verification:** The project owner shall submit to the CPM no less than one day prior to commissioning, a written statement by a California registered Professional Engineer stating that said engineer has reviewed the as-built-designs or inspected the identified equipment and certifies that the gas turbine engine and generator lube oil vents are equipped with mist eliminators.

**AQ-20** The gas turbines and auxiliary boiler shall be equipped with continuously recording, nonresettable fuel gas flowmeters on each unit.

**Verification:** The project owner shall submit to the CPM no less than one day prior to commissioning, a written statement by a California registered Professional Engineer stating that said engineer has reviewed the as-built-designs or inspected the identified equipment and certifies that the gas turbines and auxiliary boiler are equipped with continuously recording, nonresettable fuel gas flowmeters on each unit.

**AQ-21** Each gas turbine exhaust shall be equipped with continuously recording emissions monitor for NO<sub>x</sub>, CO, and O<sub>2</sub> dedicated to this unit. Continuous emission monitor shall meet the requirements of 40 CFR parts 60 and 75, and shall be capable of monitoring emissions during startups and shutdowns as well as normal operating conditions. The system shall be installed and operational prior to initial startup of the turbines.

**Verification:** The project owner shall submit to the CPM no less than one day prior to commissioning, a written statement by a California registered Professional Engineer stating that said engineer has reviewed the as-built-designs or inspected the identified equipment and certifies that each gas turbine exhaust is equipped with an operational CEMS meeting the specifications in this condition.

**AQ-22** The gas turbine exhaust stacks and boiler exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods. Access ladders and/or stairs and platforms shall allow easy access to the sampling ports.

**Verification:** The project owner shall submit to the CPM no less than one day prior to commissioning, a written statement by a California registered Professional Engineer stating that said engineer has reviewed the as-built-designs or inspected the identified equipment and certifies that each gas turbine exhaust is air tight and equipped with sampling ports that are easy to access as required by this condition.

**AQ-23** The gas turbine engine shall be fired exclusively on pipeline quality natural gas with a sulfur content no greater than 0.50 grains of sulfur compounds per 100 dry scf of natural gas.

**Verification:** The project owner shall submit to the CPM the most recent fuel testing analysis performed as part of the Quarterly Air Quality Report required in Conditions of Certification AQ-SC6.

**AQ-24** Startup is defined as the period beginning with turbine light-off (firing) until the unit meets the lb/hr and ppmv emission limits in Conditions of Certification AQ-54, -58 and -59. Shutdown is defined as the period beginning with initiation of turbine shutdown sequence and ending with cessation of firing of the gas turbine engine. Startup and shutdown durations shall not exceed 3.0 hours and one hour, respectively, per occurrence.

**Verification:** The project owner shall identify and submit to the CPM as part of the Quarterly Air Quality Report all startups and shutdowns for all units including the maximum hourly emission rate, total emissions and duration.

**AQ-25** NO<sub>x</sub>, excluding the thermal stabilization period (i.e. startup period which is not to exceed three hours), shall not exceed the following levels under load conditions:

9 x EFF/25 ppm, @ 15% O<sub>2</sub>, averaged over 15 minutes:

Where: EFF (efficiency) is the higher of the following:

$$EFF_1 = \frac{3412 \times 100\%}{AHR}$$

AHR = Actual Heat Rate at HHV of Fuel (BTU/KW-HR)]

or

$$EFF_2 = \frac{MRE \times LHV}{HHV}$$

MRE = Manufacturer's Rated Efficiency with Air Pollution Equipment at LHV, which is the manufacturer's continuous rated percent efficiency of the gas turbine with air pollution equipment after correction from LHV to HHV of the fuel at peak load for that facility.

**Verification:** The project owner shall maintain the NO<sub>x</sub> emission records required by this condition on site and shall make these records available for inspection upon request of the PCAPCD or CPM.

## **Commissioning**

**AQ-26** The commissioning period commences when all mechanical and electrical systems are installed and individual startup has been completed, or when a gas turbine is first fired, whichever comes first. The period ends when the plant has completed performance testing and is available for commercial operation.

**Verification:** The project owner shall submit for approval to the CPM, a general plan to begin, implement and complete all commissioning activities no less than 30 days prior to the expected date of the commencement of commissioning. This general plan shall include dates for implementing and completing all major milestones of commissioning. The project owner shall notify the CPM in writing of the completion of each milestone of this general plan, within five business days of the date of completion of each milestone.

**AQ-27** The gas turbines shall be tuned to minimize the air emissions. At the earliest feasible time, in accordance with the recommendations of the equipment manufacturer and construction contractor, the air pollution control equipment shall be installed, adjusted and operated to minimize emissions from the combustion turbines.

**Verification:** The general plan required in the verification of Condition of Certification AQ-26 shall specifically include, but is not limited to, dates regarding turbine tuning and the installation, adjustment and operation of the air pollution control equipment.

**AQ-28** The total number of firing hours of each gas turbine without abatement shall not exceed 160 hours during the commissioning period. Such operation shall only be limited to such activities that can only be properly executed without the air pollution control equipment.

**Verification:** The general plan required in the verification of Condition of Certification AQ-26 shall specifically include, but is not limited to, the total estimated hours of operation under all operational conditions. In reporting the completion of each milestone, the project owner shall include the actual number of hours of operation in total and for that milestone.

**AQ-29** During the commissioning operations, CO emissions shall not exceed 829 pounds per hour for any one-hour block average. Compliance to be determined by CEMS measurements. (This condition was established to prevent impacts from exceeding 500 ug/m<sup>3</sup> over an eight-hour average).

**Verification:** The general plan required in the verification of Condition of Certification AQ-26 shall specifically include, but is not limited to, an estimate of expected hourly fuel use and CO emissions in all fuel burning equipment. In reporting the completion of each milestone, the project owner shall include the actual hourly fuel use of all fuel burning equipment and the actual CO emission recorded by the CEMS or, if the CO CEMS is uncertified at the time, a CO emission estimate via a CPM approved fuel based CO emission factor.

**AQ-30** The total mass emissions of each regulated pollutant that are emitted during the period shall not exceed the quarterly emission limits specified in these conditions.

**Verification:** The general plan required in the verification of Condition of Certification AQ-26 shall specifically include, but is not limited to, an estimate of expected fuel use and emissions in all fuel burning equipment. In reporting the completion of each milestone, the project owner shall include the actual fuel use by quarter of all fuel burning equipment and the actual emissions, by quarter, of NO<sub>x</sub>, SO<sub>x</sub>, CO, VOC and

PM10 as recorded by the CEMS if available or via a CPM approved fuel based emission factor.

## **Reporting and Record Keeping**

**AQ-31** Submit to the Air Pollution Control Officer and CPM, prior to issuance of a Permit to Operate, information correlating the control system operating parameters to the associated NO<sub>x</sub> output. This information may be used by the Air Pollution Control Officer or CPM to determine compliance when there is no continuous emission monitoring system for NO<sub>x</sub> available or when the continuous emission monitoring system is not operating properly.

**Verification:** The project owner shall submit to the APCO and CPM information correlating the control system operating parameters to the associated NO<sub>x</sub> output no less than 10 days prior to the termination of the commissioning period.

**AQ-32** Provide source test information annually regarding the exhaust gas NO<sub>x</sub> concentration at ISO conditions corrected to 15 percent oxygen on a dry basis, and the demonstrated percent efficiency (EFF) of the turbine unit.

**Verification:** The project owner shall submit to the CPM source testing protocols 30 days prior to the planned source test date. The project owner shall submit to the CPM the results of the source test no less than 60 days following the actual source test date.

**AQ-33** Maintain a gas turbine operating log that includes, on a daily basis, the actual Pacific Standard Time start-up and stop time, total hours of operation, type and quantity of fuel used (liquid/gas). This information shall be available for inspection at any time from the date of entry.

**Verification:** The project owner shall make the power plant site and appropriate records available for inspection upon request from the PCAPCD or CPM.

**AQ-34** The project owner shall maintain hourly records of NO<sub>x</sub> and CO emission concentrations (ppmv @ 15percent O<sub>2</sub>), and hourly, daily, and quarterly records of NO<sub>x</sub> and CO emissions. Ongoing compliance with the CO emission limits during normal operation shall be deemed compliance with the VOC emission limits during normal operation.

**Verification:** The project owner shall submit to the CPM all concentration, hourly, daily and quarter NO<sub>x</sub> and CO emissions as part of the Quarterly Air Quality Report required by Condition of Certification AQ-SC6.

**AQ-35** The project owner shall maintain records of SO<sub>x</sub> lb/hr, lb/day, and lb/quarter emissions. SO<sub>x</sub> emissions shall be based on fuel use records, natural gas sulfur content, and mass balance calculations.

**Verification:** The project owner shall submit to the CPM all hourly, daily and quarterly SO<sub>x</sub> emissions as part of the Quarterly Air Quality Report required by Condition of Certification AQ-SC6.

**AQ-36** The project owner shall maintain the following records: occurrence, duration, and type of any startup, shutdown, or malfunction; performance testing,



evaluations, calibrations, checks, adjustments, any period during which a continuous monitoring system or monitoring device was inoperative, maintenance of any continuous emission monitor; emission measurements, total daily and rolling twelve month average hours of operation, hourly quantity of fuel used, and gross three hour average operating load.

**Verification:** The project owner shall submit to the CPM all data identified in this condition as part of the Quarterly Air Quality Report required by Condition of Certification AQ-SC6.

**AQ-37** All records required to be maintained by this permit shall be maintained for a period of five years and shall be made readily available for PCAPCD inspection upon request. Results of continuous emissions monitoring shall be reduced according to the procedure established in 40 CFR, Part 51, Appendix P. paragraphs 5.0 through 5.3.3, or by other methods deemed equivalent by mutual agreement with the PCAPCD, the ARB, and the EPA.

**Verification:** The project owner shall make the power plant site and appropriate records available for inspection upon reasonable notice from the PCAPCD or CPM.

**AQ-38** The project owner shall notify the PCAPCD of any breakdown condition as soon as reasonably possible, but no later than two PCAPCD business hours after its detection.

**Verification:** The project owner shall include the identification of all breakdowns, PCAPCD notification, resulting excess emission (if any) and corrective actions taken (if any) as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-39** Any violation of any emission standard listed in this permit which is indicated by the CEMS shall be reported to the PCAPCD no later than 96 hours after such occurrence per California Health and Safety Code 42706.

**Verification:** The project owner shall include all violations of emission standards and corresponding PCAPCD notifications in the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-40** The PCAPCD shall be notified in writing within seven calendar days following the correction of any breakdown condition. The breakdown notification shall include a description of the equipment malfunction or failure, the date and cause of the initial failure, the estimated emissions in excess of those allowed, and the methods utilized to restore normal operations.

**Verification:** The project owner shall include the identification of all breakdowns, PCAPCD notification, resulting excess emission (if any) and corrective actions taken (if any) as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-41** Audits of continuous emission monitors shall be conducted quarterly, except during quarters in which relative accuracy and total accuracy testing is performed, in accordance with EPA guidelines. The PCAPCD shall be notified

prior to completion of the audits. Audit reports shall be submitted along with quarterly compliance reports to the PCAPCD.

**Verification:** The project owner shall submit to the CPM all CEMS audits, relative accuracy tests and related transmittal memos (to the PCAPCD) within 60 days following the date of audit or test performance.

**AQ-42** The project owner shall comply with the applicable requirements for quality assurance testing and maintenance of the continuous emission monitor equipment in accordance with the procedures and guidance specified in 40 CFR Part 60, Appendix F.

**Verification:** The project owner shall include all CEMS quality assurance test failures that required corrective action as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-43** The project owner shall submit a written report to the APCO and the CPM for each calendar quarter, within 30 days of the end of the quarter, including: time intervals, data and magnitude of excess emissions, nature and cause of excess (if known), corrective actions taken and preventive measures adopted; averaging period used for data reporting shall correspond to the averaging period for each respective emission standard; applicable time and date of each period during which the CEM was inoperative (except for zero and span checks) and the nature of system repairs and adjustments; and a negative declaration when no excess emissions occurred.

**Verification:** The project owner shall include the excess emission report as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-44** The project owner shall provide the PCAPCD and CPM with a written emission statement showing actual emissions of volatile organic compounds and oxides of nitrogen. Pursuant to PCAPCD Rule 503 the project owner shall submit this emission statement on a form or in a format specified by the Air Pollution Control Officer. The statement shall contain the following information:

- A. Information contained in the California Air Resources Board's Emission Inventory Turn Around Document as described in Instructions for the Emission Data System Review and Update Report;
- B. Actual emissions of volatile organic compounds and oxides of nitrogen, in tons per year, for the calendar year prior to the preparation of the emission statement;
- C. Information regarding seasonal or diurnal peaks in the emission of affected pollutants; and
- D. Certification by a responsible official of the project owner that the information contained in the emission statement is accurate to the best knowledge of the individual certifying the emission statement.

**Verification:** The project owner shall submit to the CPM the emission statement described herein prior to the beginning of March each year.

## **Performance Testing**

**AQ-45** Compliance with the short term emission limits (lb/hr and ppmv @ 15percent O<sub>2</sub>) shall be demonstrated by a performance test conducted within 60 days of reaching maximum production and not later than 180 days from initial startup of each gas turbine engine.

**Verification:** The project owner shall submit to the PCAPCD and CPM a performance test protocol for approval 30 days prior to the planned source test date. The project owner shall submit all performance test results no less than 60 days following the actual date of performance testing.

**AQ-46** A performance test shall be conducted annually for each combustion turbine/heat recovery steam generator unit each calendar year.

**Verification:** The project owner shall submit to the PCAPCD and CPM a performance test protocol for approval 30 days prior to the planned source test date. The project owner shall submit all performance test results no less than 60 days following the actual date of performance testing.

**AQ-47** Compliance with the cold start NO<sub>x</sub>, and CO mass emission limits shall be demonstrated for one of the gas turbines engines upon initial operation and at least every seven years thereafter by performance testing by an ARB certified independent test firm.

**Verification:** The project owner shall submit to the PCAPCD and CPM a performance test protocol for approval 30 days prior to the planned source test date. The project owner shall submit all performance test results no less than 60 days following the actual date of performance testing.

**AQ-48** The following test methods shall be used: PM<sub>10</sub>: EPA method 5 (front half and back half), NO<sub>x</sub>: EPA Method 20, CO: EPA method 10 or 1 OB, O<sub>2</sub>: EPA Method 3A, VOC: EPA method 18, and fuel gas sulfur content: ASTM D3246. Alternative test methods as approved by the PCAPCD and CPM may also be used to address the source testing requirements of this permit.

**Verification:** The project owner shall submit to the PCAPCD and CPM a performance test protocol for approval 30 days prior to the planned source test date. The project owner shall submit all performance test results no less than 60 days following the actual date of performance testing.

## **Emission Limitations**

**AQ-49** No emissions are permitted, from any source, which are a nuisance per PCAPCD Rule 205, Nuisance. (Rule 205)

**Verification:** The project owner shall report all violations of this condition as noticed by the PCAPCD as well as any offsite nuisance complaints as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-50** Stack emission opacity as dark or darker than Ringelmann No. 1 (20 percent opacity) for period(s) aggregating more than three (3) minutes in any one

hour is prohibited and is in violation of PCAPCD Rule 202, Visible Emissions. (Rule 202)

**Verification:** The project owner shall report all violations of this condition as noticed by the PCAPCD as well as any offsite opacity complaints as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-51** Particulate matter emissions shall not to exceed 0.1 grains per cubic foot of gas calculated at 12 percent CO at standard conditions. (Rule 210)

**Verification:** The project owner shall submit to the PCAPCD and CPM a performance test protocol for approval 30 days prior to the planned source test date. The project owner shall submit all performance test results no less than 60 days following the actual date of performance testing.

**AQ-52** Sulfur compound emissions calculated as SO<sub>2</sub> shall not exceed 0.2 percent by volume. (Rule 210).

**Verification:** The project owner shall submit to the PCAPCD and CPM a performance test protocol for approval 30 days prior to the planned source test date. The project owner shall submit all performance test results no less than 60 days following the actual date of performance testing.

**AQ-53** The ammonia slip shall not exceed 10 ppmv @ 15 percent O<sub>2</sub> averaged over one hour.

**Protocol:** Compliance with ammonia slip limit shall be demonstrated by using the following calculation procedure:

$$\text{ammonia slip ppmv @ 15\% O}_2 = ((a - (b \times c / 1,000,000)) \times 1,000,000 / b) \times d,$$

where

a = ammonia injection rate (lb/hr) / 17 (lb/lb. mol),

b = dry exhaust gas flow rate (lb/hr) / (29 (lb/lb. mol),

c = change in measured NO<sub>x</sub> concentration ppmv at 15% O<sub>2</sub> across catalyst, and

d = correction factor.

The correction factor shall be derived annually during compliance testing by comparing the measured and calculated ammonia slip.

**Verification:** The project owner shall include ammonia slip concentrations averaged on an hourly basis calculated via the protocol provided as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

- AQ-54** The emissions from the gas turbine after air pollution controls shall not exceed the following:

Gas Turbine PPMV Limitations Excluding Startup and Shutdown		
NO <sub>x</sub>	CO	VOC
2.0 ppmvd @ 15% O <sub>2</sub> , 1-hour average	4 ppmvd @ 15% O <sub>2</sub> , 3-hour average	2 ppmv @ 15% O <sub>2</sub> , 1-hour average

**Verification:** The project owner shall submit to the PCAPCD and CPM a performance test protocol for approval 30 days prior to the planned source test date. The project owner shall submit all performance test results no less than 60 days following the actual date of performance testing.

- AQ-55** The 2.0 ppmvd NO<sub>x</sub> emission limit is averaged over one hour at 15 percent oxygen, dry basis. The limit shall not apply to the first six (6) one-hour average NO<sub>x</sub> emissions above 2.0 ppmvd, dry basis at 15 percent O<sub>2</sub>, in any calendar quarter period for each combustion gas turbine provided that it meets all of the following requirements:
- A. This equipment operates under any one of the qualified conditions described below:
    1. Rapid combustion turbine load changes due to the following conditions:
      - i. Load changes initiated by the California ISO or a successor entity when the plant is operating under Automatic Generation Control; or
      - ii. Activation of a plant automatic safety or equipment protection system which rapidly decreases turbine load
    2. The first two one-hour reporting periods following the initiation/shutdown of a fogging system injection pump
    3. The first two one-hour reporting periods following the initiation/shutdown of combustion turbine steam injection
    4. The first two one-hour reporting periods following the initiation of HRSG duct burners
    5. Events as the result of technological limitation identified by the operator and approved in writing by the PCAPCD.
  - B. The 1-hour average NO<sub>x</sub> emissions above 2.0 ppmv, dry basis at 15 percent O<sub>2</sub>, did not occur as a result of operator neglect, improper operation or maintenance, or qualified breakdown under Rule 404, Upset Conditions, Breakdown or Scheduled Maintenance. Notification to the PCAPCD is required within two hours of a qualified event.

- C. The qualified operating conditions described in (A) above are recorded in the plant's operating log within 24 hours of the event, and in the CEMS by 5 p.m. the next business day following the qualified operating condition. The notations in the log and CEMS must describe the date and time of entry into the log/CEMS and the plant operating conditions responsible for NO<sub>x</sub> emissions exceeding the 2.0 ppmv one-hour average limit. In addition, these excursions must be identified in the CEMS quarterly reports.
- D. The one-hour average NO<sub>x</sub> concentration for periods that result from a qualified operating condition does not exceed 25 ppmv, dry basis at 15 percent O<sub>2</sub>.
- E. All NO<sub>x</sub> emissions during these events shall be included in all calculations of hourly, daily, and annual mass emission rates as required by this permit.

**Verification:** Within five working days of the occurrence, the project owner shall submit an Initial Excursion Report to the CPM that includes, but is not limited to: the date, time, duration, cause of the occurrence, the emissions (in total mass and hourly concentration normalized to 15 percent O<sub>2</sub>) as a result of the occurrence and the evidence required in element (B) above. The project owner may delay the submittal of copies of the pertinent sections of the CEMS and log book records showing the excursion for no more than 21 working days following the occurrence. The project owner shall include a summary of all excursions as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-56** If the GE LM6000 turbines are selected for the project, emission rates from each gas turbine and heat recovery steam generator exhaust during startup and shutdown shall not exceed the following:

<b>GE LM6000 Combustion Turbine Emission Limitations during Startup and Shutdown</b>		
Pollutant	Maximum Pounds Per Hour (worst-case turbine)	Pounds per Startup or Shutdown (both turbines combined)
NO <sub>x</sub>	19.3	49.7
CO	14.3	42.2
VOC	1.4	6.6
PM <sub>10</sub>	3.2	19.0
SO <sub>2</sub>	0.7	3.9

**Verification:** The project owner shall include all necessary emissions data to demonstrate compliance with the emission limits provided in this Condition as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-57** If the Alstom GX100 turbines are selected for the project, emission rates from each gas turbine and heat recovery steam generator exhaust during startup and shutdown shall not exceed the following:

<b>Alstom GX100 Combustion Turbine Emission Limitations during Startup and Shutdown</b>		
Pollutant	Maximum Pounds Per Hour (worst-case turbine)	Pounds per Startup or Shutdown (both turbines combined)
NO <sub>x</sub>	37.1	122.8
CO	89.5	204.8
VOC	19.7	78.6
PM <sub>10</sub>	3.2	19.3
SO <sub>2</sub>	0.7	4.0

**Verification:** The project owner shall include all necessary emissions data to demonstrate compliance with the emission limits provided in this Condition as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-58** If the GE LM6000 turbines are selected for the project, emission rates from each gas turbine and heat recovery steam generator exhaust, except during startup and/or shutdown or excursions, shall not exceed the following:

GE LM6000 - COMBUSTION TURBINE EMISSION LIMITATIONS PER TURBINE EXCLUDING STARTUP AND SHUTDOWN	
POLLUTANT	POUNDS/HOUR
Carbon Monoxide (CO)	6.1 (three-hour rolling average)
Nitrogen Oxides (NO <sub>x</sub> )	5.0 (one-hour average)
PM-10	4.6
Sulfur Oxides (SO <sub>x</sub> )	1.0
Volatile Organic Compounds (VOCs)	1.7

**Verification:** The project owner shall include all necessary emissions data to demonstrate compliance with the emission limits provided in this Condition as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-59** If the Alstom GX100 turbines are selected for the project, emission rates from each gas turbine and heat recovery steam generator exhaust, except during startup and/or shutdown, or excursions shall not exceed the following:

Alstom GTX100 - COMBUSTION TURBINE EMISSION LIMITATIONS PER TURBINE EXCLUDING STARTUP AND SHUTDOWN	
POLLUTANT	POUNDS/HOUR
Carbon Monoxide (CO)	6.2 (three-hour rolling average)
Nitrogen Oxides (NO <sub>x</sub> )	5.1 (one-hour average)
PM-10	4.7
Sulfur Oxides (SO <sub>x</sub> )	1.0
Volatile Organic Compounds (VOCs)	1.8

**Verification:** The project owner shall include all necessary emissions data to demonstrate compliance with the emission limits provided in this Condition as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-60** If the GE LM6000 turbines are selected for the project, the daily emissions shall not exceed the following rates:

GE LM6000 - DAILY EMISSION LIMITS					
POLLUTANT	Two GE Turbines	Auxiliary Boiler	Cooling Tower	Diesel Emergency Generator	Diesel Fire Pump
NO <sub>x</sub>	268.7	16.8	--	4.31	1.72
CO	300.8	52.8	--	0.84	0.09
VOC	83.6	7.2	--	0.16	0.05
PM <sub>10</sub>	221.6	14.4	16.3	0.14	0.03
SO <sub>2</sub>	46.0	1.92	--	0.10	0.19

**Verification:** The project owner shall include all necessary emissions data to demonstrate compliance with the emission limits provided in this Condition as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-61** If the Alstom GX100 turbines are selected for the project, the daily emissions shall not exceed the following rates:

Alstom GX100 - FACILITY DAILY EMISSION LIMITS					
POLLUTANT	Two Alstom Turbines	Auxiliary Boiler	Cooling Tower	Diesel Emergency Generator	Diesel Fire Pump
NO <sub>x</sub>	406.0	16.8	--	4.31	1.72
CO	629.5	52.8	--	0.84	0.09
VOC	223.1	7.2	--	0.16	0.05
PM <sub>10</sub>	226.8	14.4	16.3	0.14	0.03
SO <sub>2</sub>	47.1	1.92	--	0.10	0.19



**Verification:** The project owner shall include all necessary emissions data to demonstrate compliance with the emission limits provided in this Condition as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-62** If the GE LM6000 turbines are selected for the project, the total facility emissions shall not exceed the following quarterly emission rates:

<b>GE LM6000 - FACILITY DAILY EMISSION LIMITS</b>					
POLLUTANT	QUARTER 1 (lbs)	QUARTER 2 (lbs)	QUARTER 3 (lbs)	QUARTER 4 (lbs)	Tons/year
NO <sub>x</sub>	17,857	16,015	19,357	19,243	36.24
CO	21,625	19,737	23,500	23,322	44.09
VOC	6,046	5,188	6,596	6,514	12.17
PM <sub>10</sub>	17,523	15,246	18,999	18,788	35.28
SO <sub>2</sub>	3,331	2,838	3,630	3,587	6.69

**Verification:** The project owner shall include all necessary emissions data to demonstrate compliance with the emission limits provided in this Condition as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-63** If the Alstom GX100 turbines are selected for the project, the total facility emissions shall not exceed the following quarterly emission rates:

<b>ALSTOM GX100 - FACILITY QUARTERLY EMISSION LIMITS</b>					
POLLUTANT	QUARTER 1 (lbs)	QUARTER 2 (lbs)	QUARTER 3 (lbs)	QUARTER 4 (lbs)	Tons/year
NO <sub>x</sub>	19,215	18,911	20,429	20,541	39.55
CO	27,121	33,872	28,515	30,202	59.86
VOC	5,832	7,455	6,672	6,890	13.42
PM <sub>10</sub>	17,854	15,513	19,378	19,158	35.95
SO <sub>2</sub>	3,400	2,893	3,709	3,663	6.83

**Verification:** The project owner shall include all necessary emissions data to demonstrate compliance with the emission limits provided in this Condition as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-64** 40 CFR 60 Subpart GG – Standards of Performance for Stationary Gas Turbines

The gas turbines are required to meet the notification, recordkeeping and performance test requirements of this regulation. The project owner must submit a written quarterly excess emission report to the Administrator. A performance test is required within 60 days of achieving maximum production or no later than 180 days of initial startup.

**Verification:** The project owner shall include the identification of all excess emissions, PCAPCD notification and corrective actions taken (if any) as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

## **COOLING TOWERS**

### **Operating Limitations**

**AQ-65** Project owner shall submit drift eliminator design details for the cooling tower prior to commencement of construction.

**Verification:** The project owner shall submit drift eliminator design details for the cooling tower at least 30 days prior to commencement of construction.

**AQ-66** No hexavalent chromium containing compounds shall be added to the cooling tower makeup water.

**Verification:** The project owner shall make the power plant site and appropriate records available for inspection upon request from the PCAPCD or CPM.

**AQ-67** Cooling tower drift eliminator drift rate shall not exceed 0.0005% of the circulating water flow.

**Verification:** See the verification of Condition of Certification AQ-65. Project owner shall submit drift eliminator design details for the cooling tower prior to commencement of construction

### **Performance Testing**

**AQ-68** A water sample analysis of cooling tower water shall be performed within 180 days of initial operation and annually thereafter.

**Verification:** The project owner shall submit to the CPM and the PCAPCD the initial and annual cooling tower water sample analysis for approval no later than 60 days following the date of test performance.

### **Emission Limitations**

**AQ-69** No emissions are permitted, from any source, which are a nuisance per PCAPCD Rule 205, Nuisance. (Rule 205)

**Verification:** The project owner shall report all violations of this condition as noticed by the PCAPCD as well as any offsite nuisance complaints as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-70** PM10 emission rate from the cooling tower shall not exceed the following limits:

COOLING TOWER EMISSION LIMITATIONS					
Pollutant	POUNDS PER DAY	QUARTER 1 (Pounds/quarter)	QUARTER 2 (Pounds/quarter)	QUARTER 3 (Pounds/quarter)	QUARTER 4 (Pounds/quarter)
PM-10	16.3	1,471	1,487	1,504	1,504

**Verification:** The project owner shall include all necessary emissions data to demonstrate compliance with the emission limits provided in this Condition as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-71** Compliance with the cooling tower PM10 emission limit shall demonstrated as follows:  $PM_{10} = \text{cooling water recirculation rate} * \text{total dissolved solids concentration in the blowdown water} * \text{design drift rate}$ .

**Verification:** The project owner shall include all necessary emissions data to demonstrate compliance with the emission limits provided in this Condition as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

## AUXILIARY BOILER

### Operating Limitations

**AQ-72** An ultra low NOx burner and flue gas recirculation system shall be installed and operated on the auxiliary boiler.

**Verification:** The project owner shall submit to the CPM no less than one day prior to the cessation of commissioning, a written statement by a California registered Professional Engineer stating that said engineer has reviewed the as-built-designs or inspected the identified equipment and certifies that the auxiliary boiler has an operational ultra low NOx burner and flue gas recirculation system.

**AQ-73** A non-resetable fuel meter shall be installed on the gas line serving the boiler.

**Verification:** The project owner shall submit to the CPM no less than one day prior to the cessation of commissioning, a written statement by a California registered Professional Engineer stating that said engineer has reviewed the as-built-designs or inspected the identified equipment and certifies that the auxiliary boiler has an operational non-resetable fuel meter.

**AQ-74** The hours of operation of the auxiliary boiler shall not exceed the following:

Boiler Hours of Operation				
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Boiler Hours of Operation	140	568	143	143

**Verification:** The project owner shall include all necessary operational data to demonstrate compliance with the limits provided in this Condition as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-75** Compliance with the boiler pounds per hour and ppmv emission limits shall be demonstrated by an initial performance test conducted within 60 days of reaching maximum production and not later than 180 days from initial startup.

**Verification:** The project owner shall submit to the CPM, performance testing protocols 30 days prior to the planned source test date. The project owner shall submit to the CPM the performance test results, no less than 60 days following the actual performance test date.

**AQ-76** The initial performance test of the boiler shall be conducted for NO<sub>x</sub>, VOC, SO<sub>x</sub>, PM-10, CO, CO<sub>2</sub>, and O<sub>2</sub>.

**Verification:** The project owner shall submit to the CPM, performance testing protocols 30 days prior to the planned source test date. The project owner shall submit to the CPM the performance test results, no less than 60 days following the actual performance test date.

**AQ-77** Performance tests shall be conducted on the boiler every other calendar year after the initial testing. These tests shall include NO<sub>x</sub>, CO, CO<sub>2</sub>, and O<sub>2</sub>.

**Verification:** The project owner shall submit to the CPM, performance testing protocols 30 days prior to the planned test date. The project owner shall submit to the CPM the performance test results, no less than 60 days following the actual performance test date.

**AQ-78** All boiler source tests shall be made in the as-found operating condition, except that source tests shall include at least one test conducted at the maximum feasible firing rate allowed by the PCAPCD permit. No source test shall be conducted within two hours after a continuous period in which fuel flow to the unit is zero, or shut off, for thirty minutes or longer.

**Verification:** The project owner shall submit to the CPM, source testing protocols 30 days prior to the planned source test date. The project owner shall submit to the CPM the source test results, no less than 60 days following the actual source test date.

**AQ-79** At least thirty (30) days prior to the compliance source tests, a written test plan detailing the test methods and procedures to be used shall be submitted for approval by the Air Pollution Control Officer and CPM. The plan shall cite the test methods to be used for the determination of compliance with the emission limitations of this rule.

**Verification:** The project owner shall submit to the CPM, source testing protocols 30 days prior to the planned source test date. The project owner shall submit to the CPM the source test results, no less than 60 days following the actual source test date.

**AQ-80** A report of the compliance test shall be submitted to the PCAPCD and CPM following completion of the source test.

**Verification:** The project owner shall submit to the CPM, source testing protocols 30 days prior to the planned source test date. The project owner shall submit to the CPM the source test results, no less than 60 days following the actual source test date.

### **Emission Limitations**

**AQ-81** The NO<sub>x</sub> emissions from the boiler shall not exceed 9.0 ppmv @ three percent O<sub>2</sub> on a three hour average.

**Verification:** The project owner shall include all necessary emissions data to demonstrate compliance with the emissions limits provided in this Condition as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-82** The CO emissions from the boiler shall not exceed 50 ppmv @ three percent O<sub>2</sub> on a three hour average.

**Verification:** The project owner shall include all necessary emissions data to demonstrate compliance with the emissions limits provided in this Condition as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-83** The boiler emissions shall not exceed any of the following:

BOILER EMISSION LIMITATIONS					
Pollutant	POUNDS Per Hour	QUARTER 1 (Pounds/quarter)	QUARTER 2 (Pounds/quarter)	QUARTER 3 (Pounds/quarter)	QUARTER 4 (Pounds/quarter)
NO <sub>x</sub>	0.7	92	372	94	94
CO	2.2	311	1,259	317	317
VOC	0.3	36	144	36	36
PM <sub>10</sub>	0.6	82	332	84	84
SO <sub>2</sub>	0.08	11	46	12	12

**Verification:** The project owner shall include all necessary emissions data to demonstrate compliance with the emissions limits provided in this Condition as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

## **DIESEL POWERED IC ENGINES POWERING FIREWATER PUMP**

### **Operating Limitations**

**AQ-84** Project owner shall submit internal combustion engine (firewater pump) design details to the PCAPCD prior to commencement of construction.

**Verification:** The project owner shall submit to the CPM and PCAPCD for approval IC engine (firewater pump) design details to the PCAPCD at least 30 days prior to commencement of construction.

**AQ-85** A non-resettable hour meter shall be installed on each engine/generator set (firewater pump) to record the hours of operation.

**Verification:** The project owner shall submit to the CPM no less than one day prior to the cessation of commissioning, a written statement by a California registered Professional Engineer stating that said engineer has reviewed the as-built-designs or inspected the identified equipment and certifies that the engine/generator set (firewater pump) is equipped with a non-resettable hour meter.

**AQ-86** Operation for maintenance and testing of the emergency diesel engine and generator shall be limited to 100 hours per year.

**Verification:** The project owner shall include all necessary operational data to demonstrate compliance with the limits provided in this Condition as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-87** Operation for other than maintenance and testing purposes shall be limited to involuntary interruptions of electrical power. Operation shall not exceed 24 hours without prior authorization by the Air Pollution Control Officer.

**Verification:** The project owner shall include all necessary operational data to demonstrate compliance with the limits provided in this Condition as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-88** The sulfur content of the diesel fuel used shall not exceed 0.05 percent.

**Verification:** The project owner shall include a summary of diesel fuel purchase records showing amounts delivered, date delivered and fuel type with the Quarterly Air Quality Report as required in Condition of Certification AQ-SC6.

## **Reporting and Recordkeeping**

**AQ-89** Records of operation and maintenance shall be kept by the Owner or Operator for a period of five years and shall be made available to the PCAPCD upon request. Information required for reporting to the PCAPCD includes, but is not limited to:

- A. The hours of operation the engine was run for maintenance and testing;
- B. The hours of operation the engine was run during interruption of electrical power; and
- C. Records of the sulfur content of the diesel fuel used.

**Verification:** The project owner shall include these records as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

## **Emission Limitations**

**AQ-90** No emissions are permitted, from any source, which are a nuisance per PCAPCD Rule 205, Nuisance.

**Verification:** The project owner shall report all violations of this condition as noticed by the PCAPCD as well as any offsite nuisance complaints as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-91** Stack emission opacity as dark or darker than Ringelmann No. 1 (20% opacity) for period or periods aggregating more than three (3) minutes in any one hour is prohibited and is in violation of PCAPCD Rule 202, Visible Emissions.

**Verification:** The project owner shall report all violations of this condition as noticed by the PCAPCD as well as any offsite opacity complaints as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-92** Particulate matter emissions shall not to exceed 0.1 grains per cubic foot of gas calculated at 12 percent CO<sub>2</sub> at standard conditions.

**Verification:** The project owner shall submit to the CPM, source testing protocols 30 days prior to the planned source test date. The project owner shall submit to the CPM the source test results, no less than 60 days following the actual source test date.

**AQ-93** Sulfur compound emissions calculated as SO<sub>2</sub> shall not exceed 0.2 percent by volume.

**Verification:** The project owner shall demonstrate compliance with this condition via the data reported for Conditions of Certification AQ-84 and -89.

**AQ-94** Nitrogen oxide emissions from the fire pump diesel engine shall not exceed 6.9 grams per brake horsepower - hour. This may be demonstrated by manufacturer's emissions data sheet.

**Verification:** The project owner shall submit to the CPM for approval the manufacturer's emissions data sheet or other compelling evidence demonstrating compliance with this condition.

**AQ-95** PM-10 emissions from the fire pump diesel engine shall not exceed 0.4 grams per brake horsepower - hour. This may be demonstrated by manufacturer's emissions data sheet.

**Verification:** The project owner shall submit to the CPM for approval the manufacturer's emissions data sheet or other compelling evidence demonstrating compliance with this condition.

**AQ-96** The fire pump diesel engine shall meet the requirements of the California Air Resources Board Airborne Toxic Control Measure for Stationary Compression Ignition Engines when it becomes effective.

**Verification:** The project owner shall submit to the CPM for approval a CARB granted certificate or other compelling evidence demonstrating compliance with this condition.

## **DIESEL IC ENGINE POWERING EMERGENCY GENERATOR**

### **Operating Limitations**

**AQ-97** Project owner shall submit IC engine design details to the PCAPCD prior to commencement of construction of the IC engine.

**Verification:** The project owner shall submit to the CPM and PCAPCD for approval IC engine (firewater pump) design details to the PCAPCD at least 30 days prior to commencement of construction.

**AQ-98** A non-resettable hour meter shall be installed on each engine/generator set to record the hours of operation.

**Verification:** The project owner shall submit to the CPM no less than one day prior to commissioning, a written statement by a California registered Professional Engineer stating that said engineer has reviewed the as-built-designs or inspected the identified equipment and certifies that the engine/generator is equipped with a non-resettable hour meter.

**AQ-99** Operation for maintenance and testing of the emergency diesel engine and generator shall be limited to 50 hours per year.

**Verification:** The project owner shall include all necessary operational data to demonstrate compliance with the limits provided in this Condition as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-100** Operation for other than maintenance and testing purposes shall be limited to involuntary interruptions of electrical power. Operation shall not exceed 24 hours without prior authorization by the Air Pollution Control Officer.

**Verification:** The project owner shall include all necessary operational data to demonstrate compliance with the limits provided in this Condition as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-101** The sulfur content of the diesel fuel used shall not exceed 0.05%.

**Verification:** The project owner shall include a summary of diesel fuel purchase records showing amounts delivered, date delivered and fuel type with the Quarterly Air Quality Report as required in Condition of Certification AQ-SC6.

## **Reporting and Recordkeeping**

**AQ-102** Records of operation and maintenance shall be kept by the Owner or Operator for a period of five years and shall be made available to the PCAPCD upon request. Information required for reporting to the PCAPCD includes, but is not limited to:

- A. The hours of operation the engine was run for maintenance and testing.
- B. The hours of operation the engine was run during interruption of electrical power.
- C. Records of the sulfur content of the diesel fuel used.

**Verification:** The project owner shall include these records as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.



## **Emission Limitations**

**AQ-103** No emissions are permitted, from any source, which are a nuisance per PCAPCD Rule 205, Nuisance. (Rule 205)

**Verification:** The project owner shall report all violations of this condition as noticed by the PCAPCD as well as any offsite nuisance complaints as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-104** Stack emission opacity as dark or darker than Ringelmann No. 1 (20 percent opacity) for period or periods aggregating more than three (3) minutes in any one hour is prohibited and is in violation of PCAPCD Rule 202, Visible Emissions. (Rule 202)

**Verification:** The project owner shall report all violations of this condition as noticed by the PCAPCD as well as any offsite opacity complaints as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-105** Particulate matter emissions shall not to exceed 0.1 grains per cubic foot of gas calculated at 12 percent CO at standard conditions. (Rule 210)

**Verification:** The project owner shall submit to the CPM, source testing protocols 30 days prior to the planned source test date. The project owner shall submit to the CPM the source test results, no less than 60 days following the actual source test date.

**AQ-106** Sulfur compound emissions calculated as SO<sub>2</sub> shall not exceed 0.2 percent by volume. (Rule 210).

**Verification:** The project owner shall demonstrate compliance with this condition via the data reported for Conditions of Certification AQ-97 and -102.

**AQ-107** Nitrogen oxide emissions from the emergency generator diesel engine shall not exceed 6.9 grams per brake horsepower - hour. This may be demonstrated by manufacturer's emissions data sheet.

**Verification:** The project owner shall submit to the CPM for approval the manufacturer's emissions data sheet or other compelling evidence demonstrating compliance with this condition.

**AQ-108** PM-10 emissions from the emergency generator diesel engine shall not exceed 0.4 grams per brake horsepower - hour. This may be demonstrated by manufacturer's emissions data sheet.

**Verification:** The project owner shall submit to the CPM for approval the manufacturer's emissions data sheet or other compelling evidence demonstrating compliance with this condition.

**AQ-109** The engine shall meet the requirements of the California Air Resources Board Airborne Toxic Control Measure for Stationary Compression Ignition Engines when it becomes effective.

**Verification:** The project owner shall submit to the CPM for approval a CARB granted certificate or other compelling evidence demonstrating compliance with this condition.

## **PORTABLE EQUIPMENT**

**AQ-110** Portable equipment shall comply with all applicable requirements while operating at the facility, including PCAPCD Permit and Prohibitory Regulations, or be State-registered portable equipment. State-registered portable equipment shall comply with State registration requirements. A copy of the State registration shall be readily available whenever the State-registered portable equipment is at the facility.

**Verification:** The project owner shall make the power plant site and appropriate records available for inspection upon request from the PCAPCD or CPM.

## **TITLE V CONDITION**

**AQ-111** The Owner/Operator shall file a complete application for a Title V permit pursuant to Rule 507, Federal Operating Permit Program by no later than one year after commencing operation.

**Verification:** No later than one year after the commencement of operation, the project owner shall submit to the CPM, a copy of the EPA Title V application.

## **PCAPCD GENERAL CONDITIONS**

**AQ-112** Authorization to construct the equipment listed and as prescribed in the approved plans and specifications is hereby granted, subject to the specified permit conditions. The construction and operation of listed equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted in the conditions. Deviation from the approved plans is not permissible without first securing approval for the changes from the Air Pollution Control Officer (Rule 501) and the CPM through an amendment of the Conditions of Certification.

**Verification:** The project owner shall maintain a current and accurate record of the Final Determination of Compliance, the Authority to Construct and Permit to Operate as issued by the PCAPCD, as well as the California Energy Commission Decision. At least 60 days prior to the planned deviation from the approved plans, the project owner shall notify the PCAPCD and the CPM in writing of the planned deviation.

**AQ-113** Written notification shall be submitted to the PCAPCD and CPM no later than seven days after completion of construction. (Rule 501)

**Verification:** The project owner shall submit written notification to the PCAPCD and CPM no later than seven days after completion of construction.

**AQ-114** This permit (consisting of the Final Determination of Compliance, the Authority to Construct, the Permit to Operate and the California Energy Commission Decision) shall be maintained on the premises of the subject equipment.(Rule 501)

**Verification:** The project owner shall maintain a current and accurate record of the Final Determination of Compliance, the Authority to Construct and Permit to Operate as

issued by the PCAPCD, as well as the California Energy Commission Decision and shall make those records available upon request.

**AQ-115** The authorized PCAPCD or CEC agents shall have the right of entry to any premises on which an air pollution emission source is located for the purpose of inspecting such source, including securing samples of emissions therefrom, or any records required to be maintained therewith by the PCAPCD. (Rule 402)

**Verification:** The project owner shall make the power plant site and appropriate records available for inspection upon request from the PCAPCD or CPM.

**AQ-116** In the event of any violation of the PCAPCD Rules and Regulations, the project owner shall take action to end such violation. (Rule 502)

**Verification:** The project owner shall report all violations and corrective action taken to the CPM within 30 days of the event.

**AQ-117** The project owner shall notify the PCAPCD within two hours of any upset conditions, breakdown or scheduled maintenance which cause emissions in excess of limits established by PCAPCD Rules and Regulations. (Rule 404)

**Verification:** The project owner shall report all excess emissions as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-118** Any alteration of the subject equipment, including a change in the method of operation, shall be reported to the PCAPCD and CPM. Such alternations may require an Authority to Construct Permit (Rule 501) and an amendment of the Conditions of Certification

**Verification:** The project owner shall report all equipment alterations to the PCAPCD and CPM 60 days prior to the alteration.

**AQ-119** Exceeding any of the limiting condition is prohibited without prior application for, and the subsequent granting of a permit modification pursuant to PCAPCD Rule 501, General Permit Requirements, Section 400.

**Verification:** The project owner shall submit all proposed permit modifications to the CPM no less than 60 days prior to the expected exceedance. The project owner shall report all exceedances to the CPM as part of the Quarterly Air Quality Report required in Condition of Certification AQ-SC6.

**AQ-120** In the event of a change of ownership, an application must be submitted to the PCAPCD. Upon any change in control or ownership of facilities constructed, operated, or modified under authority of this permit, the requirements contained in this Authority to Construct shall be binding on all subsequent owners and operators. (Rule 501)

**Verification:** The project owner shall submit written notification to the CPM of any change in ownership.

**AQ-121** Compliance of the permitted facility is required with the provisions of the "Air Toxics 'Hot Spots' Information and Assessment Act" of 1987 (Health and Safety Code Sections 44300 et seq.).

**Verification:** The project owner shall make the power plant site and appropriate records available for inspection upon reasonable notice from the PCAPCD or CPM.

**AQ-122** Performance Test Requirements: If the PCAPCD or CPM finds that additional performance tests are required to determine compliance with PCAPCD Rules and Regulations and Conditions of this Authority to Construct, reasonable written notice shall be provided to the project owner. The performance tests shall be subject to the following restrictions (Rule 501):

- A. Prior to the actual testing, a written test plan shall be submitted to the Air Pollution Control Officer and CPM detailing the sampling methods, analytical methods or detection principles to be used. The prior written approval of the Air Pollution Control Officer is required for the use of alternate test methods.
- B. The PCAPCD may require, upon reasonable written notice, the conduct by the project owner of such emissions testing or analysis as may be deemed necessary by the PCAPCD to demonstrate compliance with PCAPCD Rules and Regulations and the limiting conditions of this permit.
- C. Testing shall be conducted in accordance with 40 CFR 60, Appendix A, Methods, or equivalent methods approved by the State of California Air Resources Board (ARB) by reference in Title 17 of the California Administrative Code, or other methods specified by the project owner and approved in writing by the Air Pollution Control Officer. Independent testing contractors and analytical laboratories shall be Air Resources Board certified for the test or analysis conducted. Particulate matter testing, if requested, shall include both filterable and condensed particulate matter (e.g. Method 5 modified to include impinger catch).
- D. A report of the testing shall be submitted to the PCAPCD and the CPM after the source test is performed

**Verification:** The project owner shall submit to the CPM source testing protocols 30 days prior to the planned source test date. The project owner shall submit to the CPM the results of a source test, regardless of those results, no less than 60 days following the actual source test date.

## REFERENCES

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California Air Resources Board (CARB 2003), "Ammonia Emission Inventories for San Joaquin Valley and Southern California". September 2003.

CEC 1998. California Energy Commission. 1997 Global Climate Change, Greenhouse Gas Emissions Reduction Strategies for California, Volume 2, Staff Report. 1998.

CEC 2003. California Energy Commission. 2003 Integrated Energy Policy Report. December.

CH2MHill, Sacramento, California (CH2MHill) 2004a. Applicant's Responses to CEC Staff Data Requests 1 – 71. Submitted to the Docket on February 6, 2004

Placer County Air Pollution Control District (PCAPCD) 2003a. Preliminary Determination of Compliance. Submitted to the Docket on May 28, 2003.

Roseville Electric, Roseville, California (ROSEVILLE) 2003a. Application for Certification Volumes I & II. Submitted to the Docket on October 30, 2003.

Roseville Electric, Roseville, California (ROSEVILLE) 2003b. Supplement in Response to Data Adequacy Comments. Submitted to the Docket on December 8, 2003.

ROSEVILLE 2003b. Supplement in Response to Data Adequacy Comments. Submitted to the Docket on December 8, 2003.

Sacramento Regional Research Institute (SRRI 2004), "Placer County Economic and Demographic Profile 2004. January 2004.

Seinfeld, John H. "Atmospheric Chemistry and Physics of Air Pollution" (Seinfeld 1986), Chapter 9.7, 1986.

## APPENDIX A – AIR QUALITY MONITORING DATA ASSESSMENT

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Air quality monitoring data is used by staff to determine the probably background air quality into which a power plant project may be emitting pollutants. This is done to determine if a power plant project causes or contributes to a violation of any state or federal ambient air quality standards. In term of a cumulative impact, CEQA requires that staff consider past, present and probable future emissions. The background air quality represents the staff estimate of past and present ambient air quality. However, it is not always possible to find ambient air quality monitoring data in the vicinity of the project site. Therefore, staff must evaluate data from several monitoring stations to ensure a reasonable representation of the project site ambient air quality.

Three ambient air quality monitoring stations were chosen by staff and the City of Roseville to be included is the assessment of the background ambient air quality for the REP site. The stations chosen are the North Highlands Station located on Blackfoot way, the Roseville Station located on North Sunrise Boulevard and the Rocklin Station located on Rocklin Road. Each of the three ambient air quality monitoring stations were examined for all pollutants that were monitored (some pollutants were not monitored at some stations). Staff reviewed and analyzed both the historic trends and specific dates to determine the most reasonable representation of background air quality for the Roseville Energy Park site. **APPENDIX A Table 1** summarizes staff's findings and is identical to **AIR QUALITY Table 3**. The source of all ambient air quality monitoring data is taken from the California Air Resources Board.

**APPENDIX A Table 1**  
**Staff Recommended Background Pollution Concentrations**

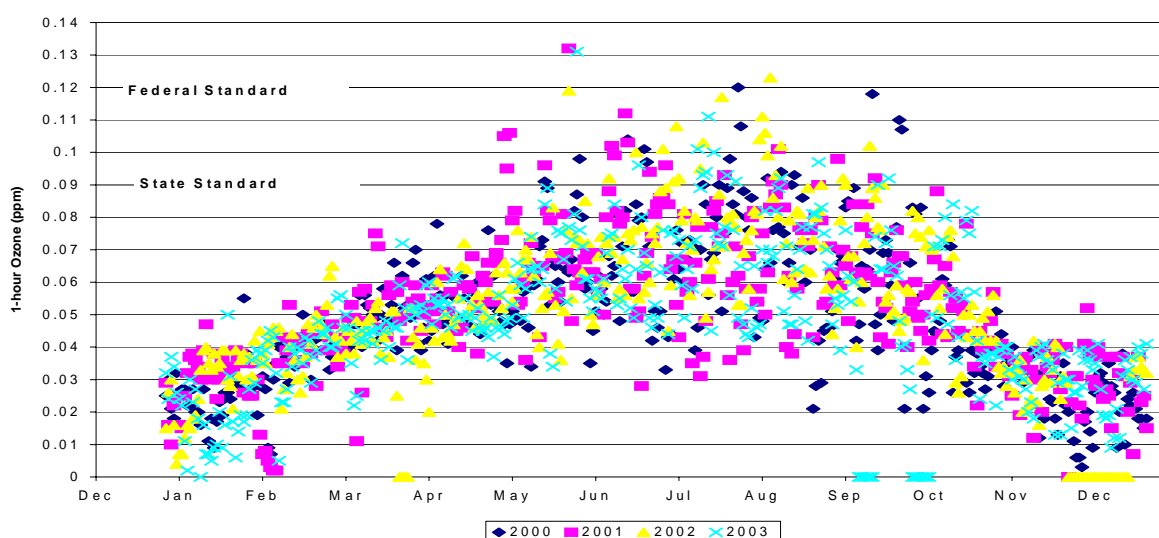
Pollutant	Averaging Time	Measurement		Station	Date
		ug/m <sup>3</sup>	ppm		
Ozone	8-hour	233	0.119	Rocklin	1998
	1-hour	300	0.153	Roseville	1998
PM10	Annual	25.2	--	Roseville	2002
	24-hour	62.0	--	Roseville	2001
PM2.5	Annual	13.4	--	Roseville	1999
	24-hour	53	--	Roseville	2002
CO	8-hour	3,122	2.81	Roseville	2002
	1-hour	5,257	4.6	Roseville	2002
NO2	Annual	30.2	0.016	Roseville	2002
	1-hour	182.4	0.097	Roseville	1998
SO2	Annual	0.05	0.002	North Highlands	2002
	24-hour	28.7	0.011	North Highlands	2001
	3-hour	31.2	0.012	North Highlands	2001
	1-hour	49.8	0.019	North Highlands	2002

Source: California Air Resources Board

# OZONE

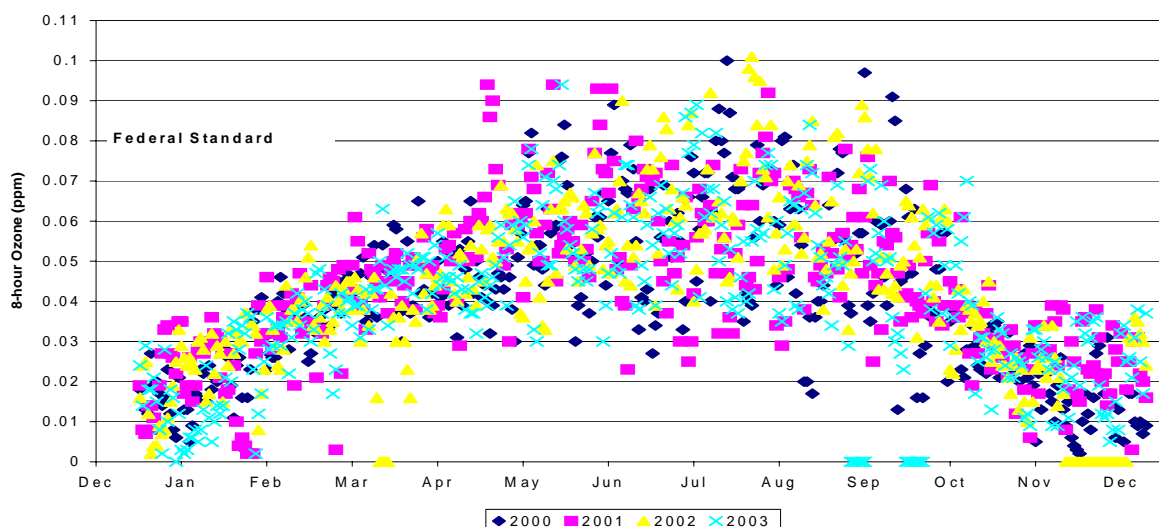
## North Highlands Monitoring Station

**APPENDIX A Figure 1**  
**Daily Maximum 1-hour Ozone Measurements**  
**North Highlands Monitoring Station**

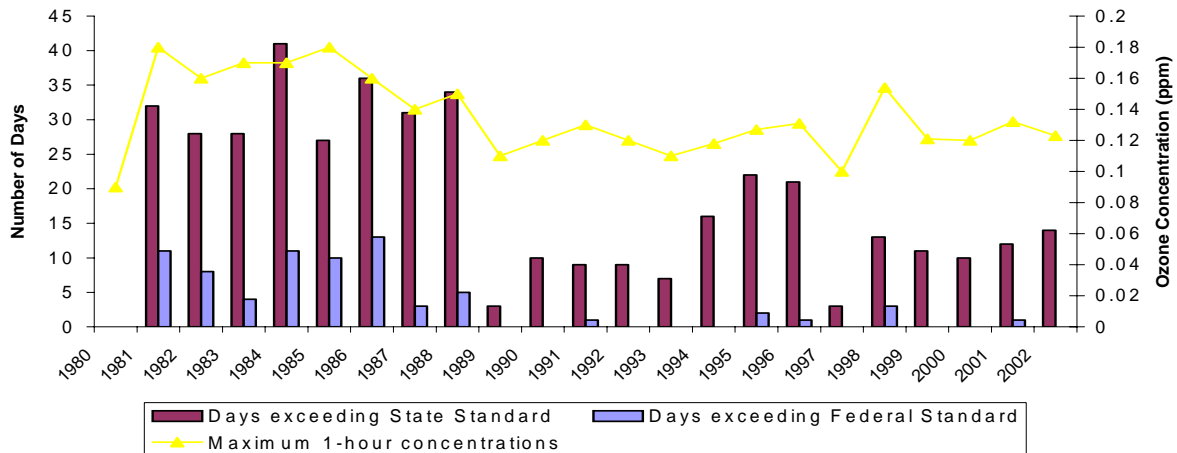


**APPENDIX A Figures 1 and 2** both show a clear seasonal trend of ozone formation up wind of the REP site vicinity. As can be seen, from 2000 to 2003, violations of the state and federal **1-hour** ozone ambient air quality standards occur starting in April and lasting into October. As can also be seen the number of violations is reasonably steady from 2000 to 2002 and decreasing in 2003.

**APPENDIX A Figure 2**  
**Daily Maximum 8-hour Ozone Measurements**  
**North Highlands Monitoring Station**



**APPENDIX A Figure 3**  
**Maximum Annual 1-hour Ozone Measurements and**  
**Number of Days in Exceedance of Ozone Standards**  
**North Highlands Monitoring Station**

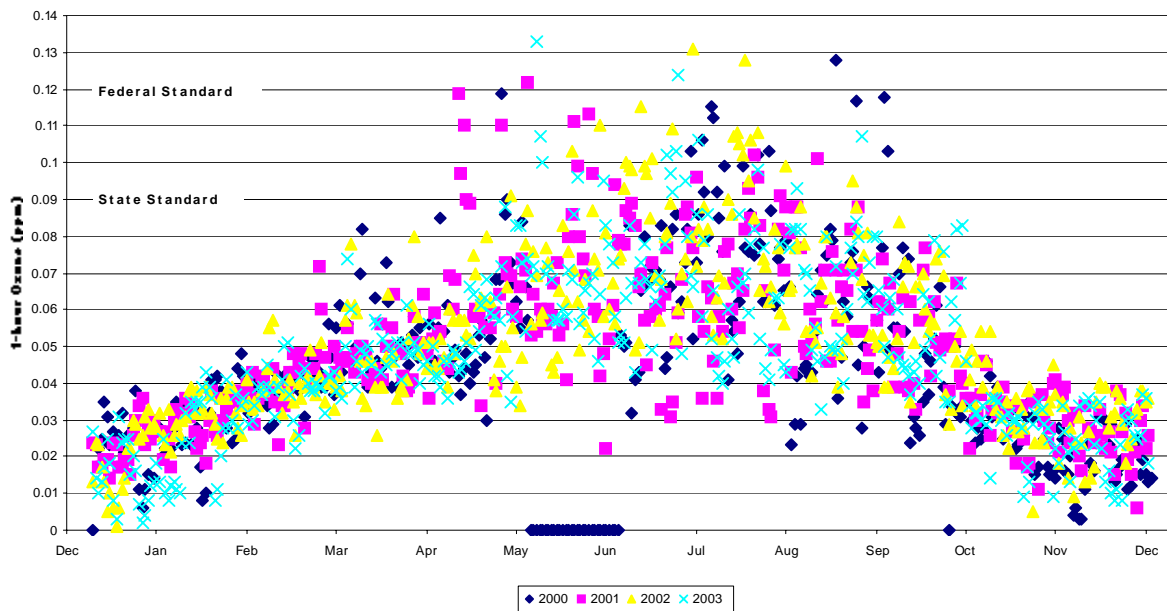


Looking further into the historically trends at the North Highlands monitoring station, it can be seen in **APPENDIX A Figure 3** that significant improvements were made from the 1980-1988 time period as compared to 1998 –2002 time period. However, only slight improvements were made from 1998 to 2002 with the highest ozone clearly being recorded in 1998.



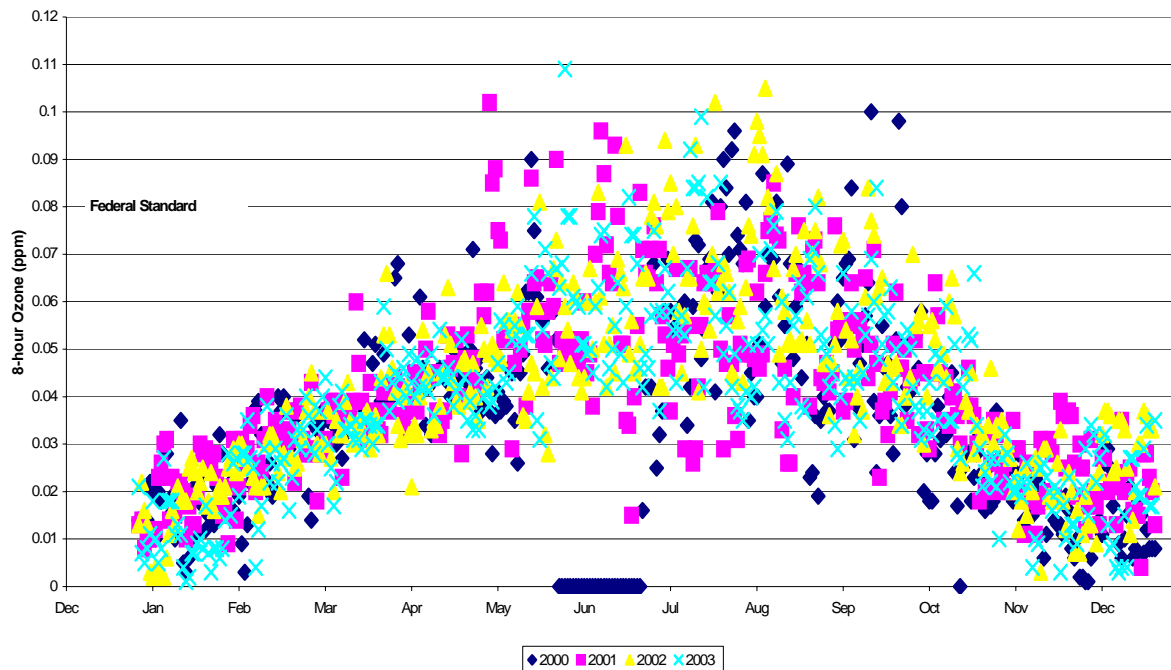
## Roseville Monitoring Station

### APPENDIX A Figure 4 Daily Maximum 1-hour Ozone Measurements Roseville Monitoring Station



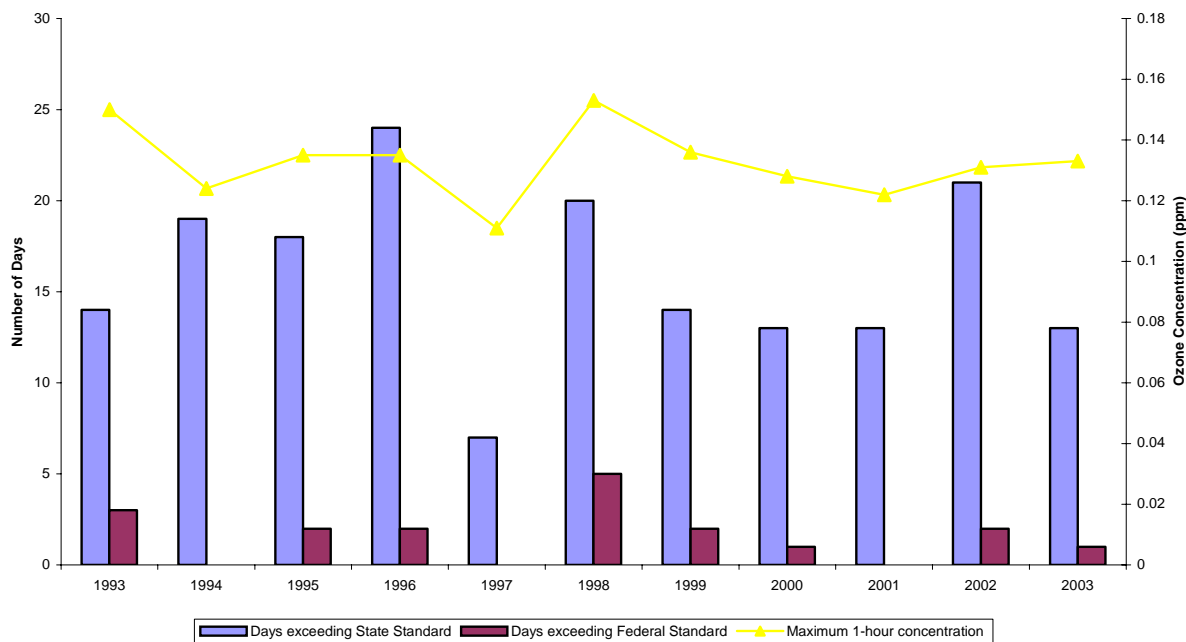
**APPENDIX A Figures 4 and 5** both show a clear seasonal trend of ozone formation down wind of the REP site vicinity. As is the case for the North Highlands monitoring station, from 2000 to 2003, violations of the state and federal **1-hour** ozone ambient air quality standards occur starting in April and lasting into October. However, the same decrease in violations is not apparent in the Roseville monitoring data.

### APPENDIX A Figure 5 Daily Maximum 8-hour Ozone Measurements Roseville Monitoring Station



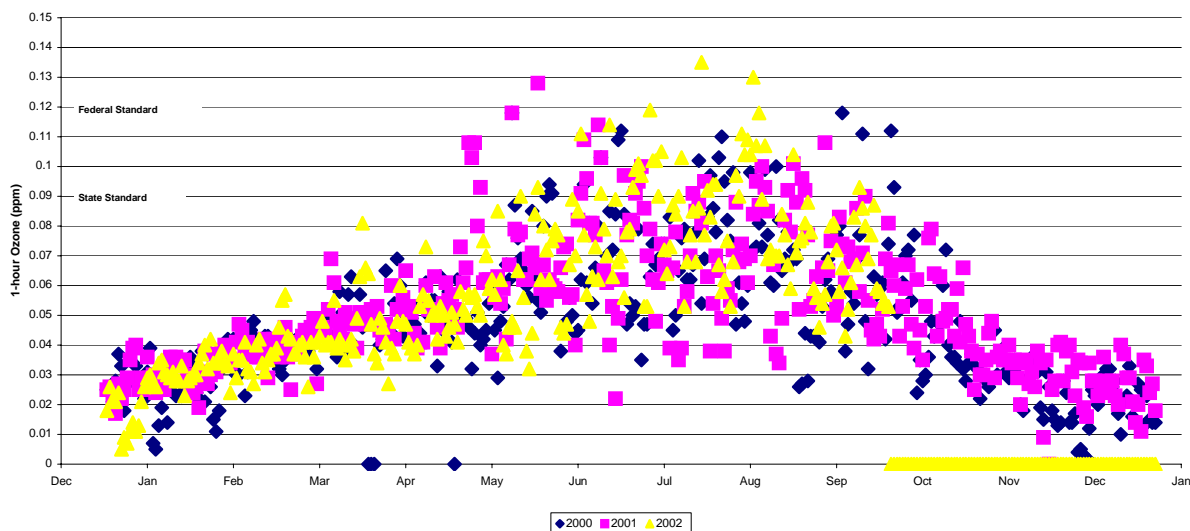
The available historic data at the Roseville Monitoring Station is from 1993 to present. As can be seen in **APPENDIX A Figure 6**, there seems to be little trend toward improvements at this monitoring station. The maximum **1-hour** ozone measurement at the Roseville Monitoring Station was made in 1998.

# **APPENDIX A Figure 6** **Maximum Annual 1-hour Ozone Measurements and** **Number of Days in Exceedance of Ozone Standards** **Roseville Monitoring Station**



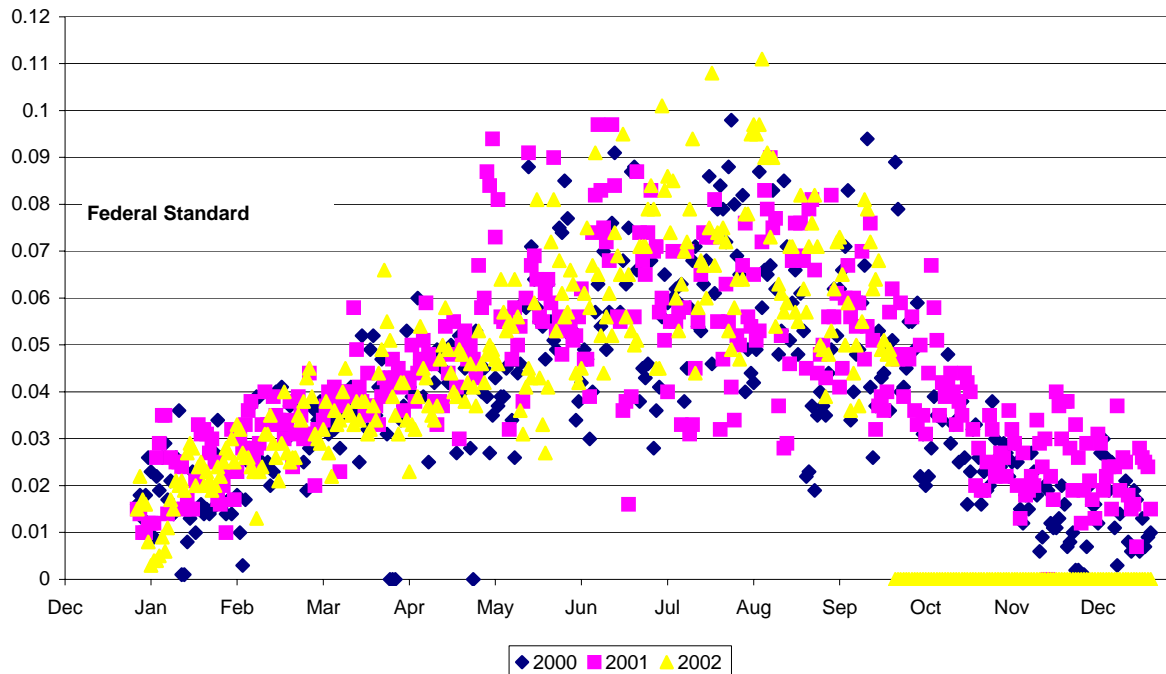
## **Rocklin Monitoring Station**

# **APPENDIX A Figure 7** **Daily Maximum 8-hour Ozone Measurements** **Roseville Monitoring Station**



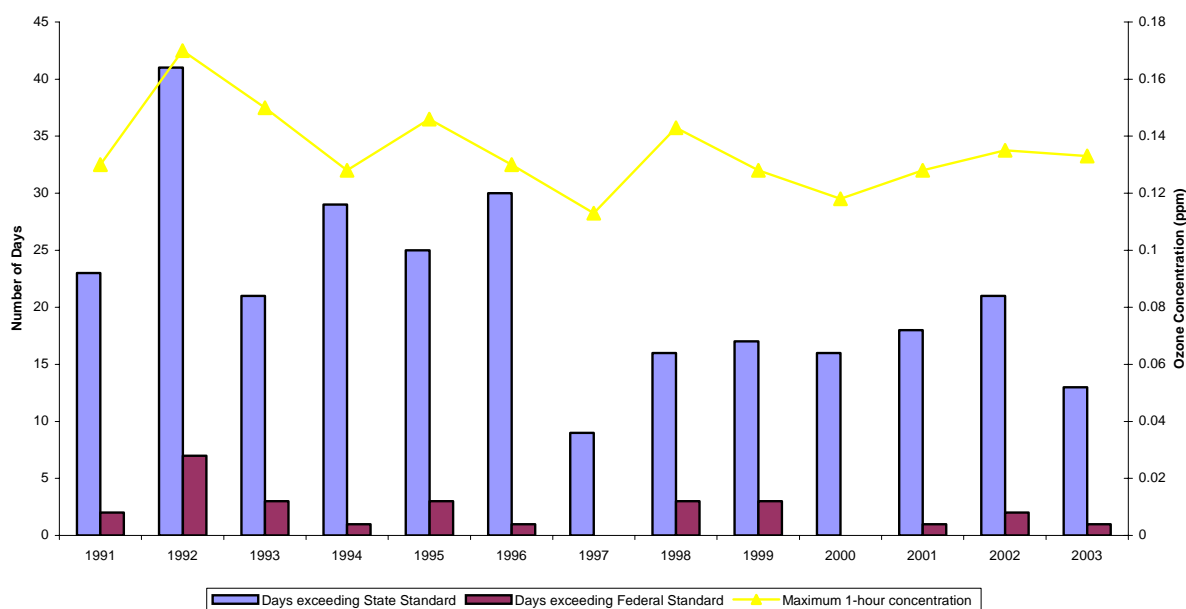
**APPENDIX A Figures 7 and 8** both show a clear seasonal trend of ozone formation down wind of the REP site vicinity. As is the case for the North Highlands and Roseville monitoring station, from 2000 to 2002 (2003 data was not available), violations of the state and federal **1-hour** ozone ambient air quality standards occur starting in April and lasting into October. As is the case with the Roseville Monitoring Station data, there seems to be little improvement in ozone violations from 2000 to 2002.

**APPENDIX A Figure 8**  
**Daily Maximum 8-hour Ozone Measurements**  
**Roseville Monitoring Station**



The available historic data at the Rocklin Monitoring Station is from 1991 to present. As can be seen in **APPENDIX A Figure 9**, there seems to be a trend toward improvement from the 1991-1996 time frame to the 1997-2003 time frame at this monitoring station. The maximum **1-hour** ozone measurement at the Roseville Monitoring Station was made in 1998.

**APPENDIX A Figure 9**  
**Maximum Annual 1-hour Ozone Measurements and**  
**Number of Days in Exceedance of Ozone Standards**  
**Roseville Monitoring Station**



In staff's opinion the seasonal and historic annual ozone data from the three monitoring stations considered correlate well and will tend to give a reasonable estimate of the ozone ambient air quality into which the REP project will emit pollutants. The highest **8-hour** ozone concentration was recorded in Rocklin in 1998 and the highest **1-hour** ozone concentration was measured in Roseville in 1998. It is staff's opinion, given the apparent lack of significant progress (some progress has been made) from 1998 to 2003, that the Rocklin and Roseville measurements represent a reasonably conservative estimate of the background **8-hour** and **1-hour** ozone ambient air quality respectively.

## PM10 AND PM2.5

PM10 and PM2.5 are monitored based on a six-day average thus graphs similar to the ozone graphs presented above can not be created. The Placer County Air Quality Management District is currently in attainment for the federal PM10 ambient air quality standards, but in non-attainment for the state PM10 ambient air quality standards. Thus **APPENDIX A Table 2** show only the days in violation for the state PM10 ambient air quality standards. The days-in-violation is a calculation, which simple thought of is multiplying the number of violations recorded by the average number days (typically 6) over which the recordings were made. Thus the days-in-violations is actually the estimated days-in-violation, that is also way this is often a decimal number and not an integer.

**APPENDIX A Table 2**  
**Days of Violation of the State PM10 24-hour Ambient Air Quality Standard**

	<b>North Highlands</b>	<b>Roseville</b>	<b>Rocklin</b>
2003	--	6.1	not available
2002	--	6.1	--
2001	--	23.8	12
2000	12.6	11.4	0
1999	--	24.5	30.5
1998	--	17.6	5.8
1997	--	0	0
1996	24.4	0	0
1995	--	7.4	3.7
1994	--	16.0	4.0

The dash marks in **APPENDIX A Table 2** represent years in which there was not enough consistent monitoring data to make a reasonable calculation. Thus North Highlands only recorded two years of data that could be used to calculate the number of days in exceedance of the PM10 **24-hour** state ambient air quality standard. The Roseville data shows the most consistent monitoring, thus in staff's opinion the Roseville Monitoring Station should be deferred to for the description of the background PM10 ambient air quality (both **annual** and **24-hour**).

**APPENDIX A Table 3** shows the historic annual average and maximum **24-hour** measurements of PM10 at the Roseville Monitoring Station. Comparing the 2000-2003 time frame with the 1994-1999 time frame, a reasonably clear division in maximum annual 24-hour measurements is evident and appears to be consistently decreasing. Therefore, it is staff's opinion that the most reasonable representation of the REP site PM10 ambient air quality is that taken from the Roseville Monitoring Station between 2000 and 2003. For **annual** average PM10 this would be 25.2 ug/m<sup>3</sup> recorded in 2002, and for the **24-hour** average PM10 this would be 62.0 ug/m<sup>3</sup> recorded in 2001.

**APPENDIX A Table 3**  
**Annual Average and Maximum Recorded 24-hour PM10 Measurements**  
**Roseville Monitoring Station (ug/m<sup>3</sup>)**

	<b>Annual Average</b>	<b>Highest Annual 24-hour</b>
2003	21.3	59.0
2002	25.2	61.0
2001	24.7	62.0
2000	24.5	62.0
1999	26.7	89.0
1998	23.0	72.0
1997	22.1	50.0
1996	20.9	39.0
1995	24.1	61.0
1994	25.3	65.0

Of the three monitoring stations considered, the Roseville Monitoring Station is the only one that monitored PM<sub>2.5</sub> ambient air quality. From the available data shown in **APPENDIX A Table 4**, staff recommends that the **annual** average PM<sub>2.5</sub> background that would most reasonably represent the REP site is 13.4 recorded in 1999. However, it is staff's opinion that the maximum annual **24-hour** average measurement of 79.0 ug/m<sup>3</sup> recorded in 1999 is not representative of the REP site, as other years recorded values that are 40% to 80% of the 1999 value. Staff recommends the 2002 recording of 53.0 ug/m<sup>3</sup> as a conservative representation of the REP site PM<sub>2.5</sub> **annual** ambient air quality.

**APPENDIX A Table 4**  
**Annual Average and Maximum Recorded 24-hour PM<sub>2.5</sub> Measurements**  
**Roseville Monitoring Station (ug/m<sup>3</sup>)**

	<b>Annual Average</b>	<b>Highest Annual 24-hour</b>
2003	not available	30.0
2002	13.2	53.0
2001	11.9	49.0
2000	12.2	51.0
1999	13.4	79.0
1998	not available	63.0

## OXIDES OF CARBON, NITROGEN AND SULFUR

The District is in attainment of the carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>) and sulfur dioxide (SO<sub>2</sub>) federal and state ambient air quality standards. Unlike the situation for ozone and PM<sub>10</sub>/PM<sub>2.5</sub>, the background air quality does not exceed the federal or state ambient air quality standards.

Ambient air CO concentrations were measured at the North Highlands and Roseville stations and are shown in **APPENDIX A Table 5**. The historic data show very low CO measurements and demonstrate no clear trend. Staff recommends the 2002 Roseville data to represent the **1-hour** and **8-hour** CO ambient air quality for the REP site because Roseville is the closer monitoring station to the REP site.

**APPENDIX A Table 5**  
**Annual Maximum Recorded 1-hour and 8-hour CO Measurements**  
**North Highlands and Roseville Monitoring Station (ppm)**

	<b>North Highlands</b>		<b>Roseville</b>	
	<b>Maximum 1-hour</b>	<b>Maximum 8-hour</b>	<b>Maximum 1-hour</b>	<b>Maximum 8-hour</b>
2003	3.2	2.1	2.4	1.6
2002	3.7	3.1	4.6	2.8
2001	4.4	3.1	3.1	1.9
2000	4.1	3.1	3.2	2.4

NO<sub>2</sub> ambient air concentration measurements were taken at the North Highlands and Roseville monitoring station, which are upwind and downwind respectively. The

maximum **1-hour** concentrations and annual average concentrations measured are shown in **APPENDIX A Table 6**. As can be seen, there is not a significant difference between the upwind (North Highlands) and downwind (Roseville) monitoring measurements made for NO<sub>2</sub>. Furthermore, it is clear that there is little or no trend in the monitoring data for NO<sub>2</sub>, at either the North Highlands or Roseville stations. This leads staff to recommend that the maximum **1-hour** NO<sub>2</sub> background concentration for the REP site be represented by the 1998 Roseville measurement, as it is the highest measure and Roseville is the closer of the two monitoring stations. Staff also recommends the 2002 measurement at the Roseville station for the **annual** average NO<sub>2</sub> background for the REP site as it is the highest measurement and most recent (it is identical to the 1998 measurement).

**APPENDIX A Table 6**  
**Annual Average and Maximum Recorded 1-hour NO<sub>2</sub> Measurements**  
**North Highlands and Roseville Monitoring Station (ppm)**

	North Highlands		Roseville	
	Maximum Hourly	Annual Average	Maximum Hourly	Annual Average
2003	0.087	0.015	0.083	0.014
2002	0.067	0.015	0.075	0.016
2001	0.075	0.014	0.086	0.015
2000	0.085	0.014	0.082	0.016
1999	0.070	0.014	0.093	0.012
1998	0.101	0.014	0.097	0.016
1997	0.067	0.013	0.080	0.015
1996	0.074	0.014	0.100	0.016
1995	0.079	insufficient monitoring	0.093	0.017

Ambient air SO<sub>2</sub> concentrations were measured at the North Highlands station and are shown in **APPENDIX A Table 7**. The historic data show very low SO<sub>2</sub> measurements and demonstrate no clear trend. Staff recommends 2002 measurements to represent the REP site **1-hour** and **annual** average SO<sub>2</sub> ambient air quality and the 2001 measurements for the **3-hour** and **24-hour** SO<sub>2</sub> ambient air quality.

**APPENDIX A Table 7**  
**Annual Average and Maximum Recorded 1, 3 and 24-hour SO<sub>2</sub> Measurements**  
**North Highlands Monitoring Station (ppm)**

	Maximum 1-hour	Maximum 3-hour	Maximum 24-hour	Annual Average
2003	0.008	NA	0.006	0.001
2002	0.019	0.011	0.009	0.002
2001	0.014	0.012	0.011	0.002
2000	0.013	0.008	0.005	0.002



## APPENDIX B – ESTIMATED PLACER COUNTY AMMONIA INVENTORY

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PM10/PM2.5 can be formed downwind from an emission source as a secondary emission (similar to ozone) from a reaction between ammonia and airborne acids. The most dominant reactions are between SO<sub>x</sub> emissions (as sulfuric acid, H<sub>2</sub>SO<sub>4</sub>) and NO<sub>x</sub> emissions (as nitric acid, HNO<sub>3</sub>). The complexity of these reactions arises from the formation of gaseous, liquid and solid forms of the products and reactants involved. The qualitative understanding of these reactions indicates that all the available ammonia will be reacted with all the available sulfuric acid prior to any ammonia being reacted with any available nitric acid (Seinfeld 1986). From this presumption, two cases of interest arise. The sulfate rich case (or ammonia limited), where the molar ratio of ammonia (NH<sub>3</sub>) to sulfate (SO<sub>4</sub>) is less than two, so that there is insufficient ammonia to react with the sulfate. The ammonia rich case, where the molar ratio of ammonia to sulfate is greater than two, so that the sulfate is completely reacted and there is excess ammonia (Seinfeld 1986).

For the purpose of determining the secondary PM10/PM2.5 potential impacts, it is necessary to determine first, if the area is either ammonia rich or ammonia limited as discussed above, and second, to determine what additional ammonium sulfate and ammonium nitrate are likely to form. Lastly, those impacts must be compared to the existing background measurements. Unfortunately, no information is available to complete any of these steps. What can be done is to determine if the potential exists for ammonia, SO<sub>x</sub> and NO<sub>x</sub> emissions from the proposed REP facility to contribute to an existing violation of the PM10 or PM2.5 state ambient air quality standards.

There is no ammonia inventory data available for Placer County. However, from ammonia inventories of other counties and air districts (as well as the state inventory), it is clear that such inventories are dominated by livestock (45 percent statewide), on-road mobile (19 percent statewide) and composting, fertilizers, and other agricultural sources (19 percent statewide). Currently, there are two ammonia inventories available from CARB in addition to the state inventory: San Joaquin Valley Air Pollution Control District (2000) and South Coast Air Quality Management District (2000). Staff has modified the San Joaquin inventory slightly such that, in staff's opinion, the resulting inventory is a reasonable estimate of what the Placer County ammonia inventory might be.

**APPENDIX B Table 1** compares the inventories of the San Joaquin Valley and South Coast air basins. It can be seen is that the San Joaquin Valley is agriculturally dominated while the South Coast is industrially dominated. It is staff's impression that the Placer County inventory would most likely be some where between these two extremes, but somewhat closer to San Joaquin than South Coast.

**APPENDIX B Table 1**  
**Comparison of San Joaquin Valley and South Coast Ammonia Inventories**

	San Joaquin Valley		South Coast	
	Ammonia (tons/day)	% of total Inventory	Ammonia (tons/day)	% of total Inventory
Burning Residential, Ag. and Timber	1.52	0.4%	NA	--
Landfill and Composting	17.33	4.7%	9.8	5.4%
Domestic	5.05	1.4%	24.6	13.5%
Fertilizer Applications	15.26	4.1%	6.1	3.4%
Livestock	308.78	83.7%	60.4	33.2%
Motor Vehicles	5.13	1.4%	33.3	18.4%
Native Animals	1.40	0.4%	0.17	0.1%
Industrial Sources	0.58	0.2%	13.2	7.3%
Soil - Natural & Ag.	13.70	3.7%	34.2	18.8%
<b>Total</b>	<b>368.74</b>		<b>181.7</b>	

Less than one percent of employees in Placer County are engaged in the Agricultural sector while Trade, Transportation, & Utilities sector makes up close to 20 percent of the county's total employment in 2002 (SRRI 2004). Therefore, it is reasonable to assume that the Placer County ammonia inventory (if one existed) would not have significant contributions from livestock or agricultural sources. That leaves on-road mobile sources as the only major contributor to a Placer County ammonia inventory. Staff eliminated the majority of the livestock, composting and fertilizer contributions from the San Joaquin Valley ammonia inventory so that it could be used as a proxy to more closely reflect the expectations of a Placer County ammonia inventory.

In **APPENDIX B Table 2**, Staff eliminated the majority of the livestock, composting and fertilizer contributions from the San Joaquin Valley ammonia inventory so that it could be used as a proxy to more closely reflect the expectations of a Placer County ammonia inventory. Specifically, staff has eliminated the ammonia sources of composting, fertilizer, beef cattle, dairy cattle, and poultry. Since these sources are primarily a function of the farming, cattle and poultry industries and such industries are assumed to be not significant in the Placer County area. Thus, staff estimates the ammonia inventory to be approximately 36 tons/day.

**APPENDIX B Table 2**  
**Staff Modification of San Joaquin Valley Ammonia Inventory**  
**to Estimate Placer County Ammonia Inventory**

	San Joaquin Valley		Estimated Placer County	
	Ammonia (tons/day)	% of total Inventory	Ammonia (tons/day)	% of total Inventory
Burning Residential, Ag. and Timber	1.52	0.4%	1.52	4.2%
Landfill and Composting	17.33	4.7%	2.51 <sup>a</sup>	7.0%
Domestic	5.05	1.4%	5.05	14.0%
Fertilizer Applications	15.26	4.1%	0	0%
Livestock	308.78	83.7%	6.05 <sup>b</sup>	16.8%
Motor Vehicles	5.13	1.4%	5.13	14.3%
Native Animals	1.40	0.4%	1.40	3.9%
Industrial Sources	0.58	0.2%	0.58	1.6%
Soil - Natural & Ag.	13.70	3.7%	13.70	38.2%
<b>Total</b>	<b>368.74</b>		<b>35.9</b>	
Notes:				
<sup>a</sup> Includes Landfill sources only, no major composting.				
<sup>b</sup> Includes only the "other" category of livestock, non-beef, non-dairy and non-poultry.				

In comparison to the ammonia rich areas of San Joaquin Valley (368.7 tons/day) and the South Coast (181.7 tons/day), the estimated ammonia inventory of Placer County (36 tons/day) leads staff to presume that the area is most likely ammonia limited. Thus, as discussed above, it is likely that the release of further ammonia would lead to further PM10/PM2.5 formation downwind. However, it is not possible to determine the rate at which this could occur with the available information. Therefore, staff concludes that the release of ammonia slip from the REP facility has a high likelihood of forming additional PM10/PM2.5 downwind and thus contributing to an existing violation of the PM10 or PM2.5 state ambient air quality standards.

## APPENDIX C – EMISSION CALCULATIONS

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### LM6000 EMISSION CALCULATIONS

#### Emission Assumptions

	Peak Load (Lbs/hr)	Base Load (Lbs/hr)
NOx	4.99354	3.40784
CO	6.08073	4.1496
ROC	1.74166	1.18789
PM10	4.61679	3.16563
SO2	0.9591	0.65717
NH3	9.2	6.3

#### Operation Assumptions

	Quarters				
	1	2	3	4	Annual
Base load Operation per Turbine	1,123	1,188	751	852	3,914
Peak Load Operation per Turbine/HRSG	929	559	1,347	1,246	4,081
Hot Starts (number)	25	71	29	42	167
Warm Starts (number)	8	20	1	1	30
Cold Starts (number)	1	2	1	1	5
Startup and Shutdown per Turbine (hours)	44	117	34	47	242
Total Hours of Operation per Turbine	2096	1864	2132	2145	8237
Auxiliary Boiler	140	568	143	143	995
Emergency Generator	12.5	12.5	12.5	12.5	50
Firewater Pump	12.5	12.5	12.5	12.5	50
Cooling Tower	2160	2184	2208	2208	8760

#### Estimated Quaterly Emissions

	Quarters (lbs)				
	1	2	3	4	Annual
Base load Operation					
NOx	7,654	8,098	5,118	5,806	26676
CO	9,320	9,860	6,232	7,070	32482
ROC	2,668	2,822	1,784	2,024	9298
PM10	7,110	7,522	4,754	5,394	24780
SO2	1,476	1,562	988	1,120	5146
NH3	14,150	14,968	9,462	10,736	49316
					147698

	Quarters (lbs)					
Peak Load Operation	1	2	3	4	Annual	
NOx	9,278	5,582	13,452	12,444	40756	
CO	11,298	6,798	16,382	15,154	49632	
ROC	3,236	1,948	4,692	4,340	14216	
PM10	8,578	5,162	12,438	11,506	37684	
SO2	1,782	1,072	2,584	2,390	7828	
NH3	17,094	10,286	24,784	22,926	75090	
Hot Starts						
NOx	398	1129	461	668	2656	
CO	408	1157	473	685	2723	
ROC	58	163	67	97	385	
PM10	158	447	183	265	1053	
SO2	33	92	38	55	218	
Warm Starts						
NOx	234	584	29	29	876	
CO	221	552	28	28	829	
ROC	36	90	5	5	136	
PM10	102	254	13	13	382	
SO2	21	52	3	3	79	
Cold Starts						
NOx	50	99	50	50	249	
CO	42	84	42	42	210	
ROC	7	13	7	7	34	
PM10	19	38	19	19	95	
SO2	4	8	4	4	20	
Total for Startups						
NOx	682	1812	540	747	3781	
CO	671	1793	543	755	3762	
ROC	101	266	79	109	555	
PM10	279	739	215	297	1530	
SO2	58	152	45	62	317	
Turbine Total						
NOx	17,614	15,492	19,110	18,997	71,213	35.6065
CO	21,289	18,451	23,157	22,979	85,876	42.938
ROC	6,005	5,036	6,555	6,473	24,069	12.0345
PM10	15,967	13,423	17,407	17,197	63,994	31.997
SO2	3,316	2,786	3,617	3,572	13,291	6.6455
Boiler						
NOx	95	386	97	97	675	
CO	321	1,301	327	327	2276	
ROC	43	176	44	44	307	
PM10	81	329	83	83	576	
SO2	11	45	11	11	78	

	Quarters (lbs)				Annual	
Generator	1	2	3	4		
NOx	54	54	54	54	216	
CO	11	11	11	11	44	
ROC	2	2	2	2	8	
PM10	2	2	2	2	8	
SO2	1	1	1	1	4	
Fire Pump						
NOx	43	43	43	43	172	
CO	2	2	2	2	8	
ROC	1	1	1	1	4	
PM10	1	1	1	1	4	
SO2	5	5	5	5	20	
Cooling Tower						
NOx	0	0	0	0	0	
CO	0	0	0	0	0	
ROC	0	0	0	0	0	
PM10	1,471	1,487	1,504	1,504	5966	
SO2	0	0	0	0	0	
Facility Total						
NOx	17,806	15,975	19,304	19,191	72276	36.138
CO	21,623	19,765	23,497	23,319	88204	44.102
ROC	6,051	5,215	6,602	6,520	24388	12.194
PM10	17,522	15,242	18,997	18,787	70548	35.274
SO2	3,333	2,837	3,634	3,589	13393	6.6965

Start Type->	Single Turbine Train (lbs/hr)			Two Turbine Trains (lbs)		
	Hot	Warm	Cold	Hot	Warm	Cold
NOx	8.8	12.2	19.3	15.9	29.2	49.7
CO	9.2	10.8	14.3	16.3	27.6	42.2
ROC	1.4	1.4	1.4	2.3	4.5	6.6
PM10	3.2	3.2	3.2	6.3	12.7	19
SO2	0.7	0.7	0.7	1.3	2.6	3.9
Duration (hours)	1	2	3			

<i>Lbs/hr</i>	Boiler	Pump	Generator	Cooling Tower
NOx	0.68	3.44	4.31	0
CO	2.29	0.18	0.84	0
ROC	0.31	0.1	0.16	0
PM10	0.58	0.06	0.14	0.681
SO2	0.08	0.38	0.1	0

## GTX100 EMISSION CALCULATIONS

### Emission Assumptions

	Peak Load (Lbs/hr)	Base Load (Lbs/hr)
NOx	5.133	3.469
CO	6.226	4.224
ROC	1.783	0.363
PM10	4.726	3.222
SO2	0.981	0.669
NH3	9.2	6.3

### Operation Assumptions

	Quarters				
	1	2	3	4	Annual
Base load Operation per Turbine	1,123	1,188	751	852	3,914
Peak Load Operation per Turbine/HRSG	929	559	1,347	1,246	4,081
Hot Starts (number)	25	71	29	42	167
Warm Starts (number)	8	20	1	1	30
Cold Starts (number)	1	2	1	1	5
Startup and Shutdown per Turbine (hours)	44	117	34	47	242
Total Hours of Operation per Turbine	2096	1864	2132	2145	8237
Auxiliary Boiler	140	568	143	143	994
Emergency Generator	12.5	12.5	12.5	12.5	50
Firewater Pump	12.5	12.5	12.5	12.5	50
Cooling Tower	2160	2184	2208	2208	8760

### Estimated Quarterly Emissions

	Quarters (lbs)				
	1	2	3	4	Annual
Base load Operation					
NOx	7,792	8,242	5,210	5,912	27156
CO	9,488	10,036	6,344	7,198	33066
ROC	816	862	546	618	2842
PM10	7,236	7,656	4,840	5,490	25222
SO2	1,502	1,590	1,004	1,140	5236
NH3	14,150	14,968	9,462	10,736	49316
					142838

	Quarters (lbs)					
Peak Load Operation	1	2	3	4	Annual	
NOx	9,538	5,738	13,828	12,792	41896	
CO	11,568	6,960	16,772	15,516	50816	
ROC	3,312	1,994	4,804	4,444	14554	
PM10	8,780	5,284	12,732	11,778	38574	
SO2	1,822	1,096	2,642	2,444	8004	
NH3	17,094	10,286	24,784	22,926	75090	
Hot Starts						
NOx	853	2421	989	1432	5695	
CO	4020	11417	4663	6754	26854	
ROC	970	2755	1125	1630	6480	
PM10	160	454	186	269	1069	
SO2	33	92	38	55	218	
Warm Starts						
NOx	705	1762	88	88	2643	
CO	1505	3762	188	188	5643	
ROC	614	1534	77	77	2302	
PM10	103	258	13	13	387	
SO2	22	54	3	3	82	
Cold Starts						
NOx	123	246	123	123	615	
CO	205	410	205	205	1025	
ROC	79	157	79	79	394	
PM10	19	39	19	19	96	
SO2	4	8	4	4	20	
Total for Startups						
NOx	1681	4429	1200	1643	8953	
CO	5730	15589	5056	7147	33522	
ROC	1663	4446	1281	1786	9176	
PM10	282	751	218	301	1552	
SO2	59	154	45	62	320	
Turbine Total						
NOx	19,011	18,409	20,238	20,347	78,005	39.0025
CO	26,786	32,585	28,172	29,861	117,404	58.702
ROC	5,791	7,302	6,631	6,848	26,572	13.286
PM10	16,298	13,691	17,790	17,569	65,348	32.674
SO2	3,383	2,840	3,691	3,646	13,560	6.78
Boiler						
NOx	95	386	97	97	675	0.3375
CO	321	1,301	327	327	2276	1.138
ROC	43	176	44	44	307	0.1535
PM10	81	329	83	83	576	0.288
SO2	11	45	11	11	78	0.039



	Quarters (lbs)				Annual	
Generator	1	2	3	4		
NOx	54	54	54	54	216	0.108
CO	11	11	11	11	44	0.022
ROC	2	2	2	2	8	0.004
PM10	2	2	2	2	8	0.004
SO2	1	1	1	1	4	0.002
Fire Pump						
NOx	43	43	43	43	172	0.086
CO	2	2	2	2	8	0.004
ROC	1	1	1	1	4	0.002
PM10	1	1	1	1	4	0.002
SO2	5	5	5	5	20	0.01
Cooling Tower						
NOx	0	0	0	0	0	0
CO	0	0	0	0	0	0
ROC	0	0	0	0	0	0
PM10	1,471	1,487	1,504	1,504	5966	2.983
SO2	0	0	0	0	0	0
Facility Total						
NOx	19,203	18,892	20,432	20,541	79068	39.534
CO	27,120	33,899	28,512	30,201	119732	59.866
ROC	5,837	7,481	6,678	6,895	26891	13.4455
PM10	17,853	15,510	19,380	19,159	71902	35.951
SO2	3,400	2,891	3,708	3,663	13662	6.831

Start Type->	Single Turbine Train (lbs/hr)			Two Turbine Trains (lbs)		
	Hot	Warm	Cold	Hot	Warm	Cold
NOx	22.6	37.1	37.1	34.1	88.1	122.8
CO	83.5	89.5	89.5	160.8	188.1	204.8
ROC	19.6	19.7	19.7	38.8	76.7	78.6
PM10	3.2	3.2	3.2	6.4	12.9	19.3
SO2	0.7	0.7	0.7	1.3	2.7	4
Duration (hours)	1	2	3			

Lbs/hr	Boiler	Pump	Generator	Cooling Tower
NOx	0.68	3.44	4.31	0
CO	2.29	0.18	0.84	0
ROC	0.31	0.1	0.16	0
PM10	0.58	0.06	0.14	0.681
SO2	0.08	0.38	0.1	0

## EMISSION REDUCTION CREDITS

			Original Certificate Value								
							Quarter (lbs)				
District	Certificate	Pollutant	1	2	3	4	Annual (lbs)	Annual (tons)	Distance Ratio	Additional Adjustment	Comments
Placer	2001-22	PM10	2,578	22,263	16,085	15,916	56,842	28.42	1.3		
Placer	2001-23	NOx	5,050	5,050	5,050	5,050	20,200	10.10	2		
Placer	2001-24	PM10	14,700	14,700	14,700	14,700	58,800	29.40	2		
Placer	2001-26	VOC	33,512	33,512	33,512	33,512	134,048	67.02	2	2.6	VOC for NOx Trading Ratio
Yolo-Solano	EC-209 (EC-238)	NOx	0	6,888	0	3,542	10,430	5.22	2.1	10%	10% is held back for sale in Yolo-Solano only.
Yolo-Solano	EC-210	NOx	0	10,620	0	4,414	15,034	7.52	2.1	10%	10% is held back for sale in Yolo-Solano only.

			Modified Certificate Value						
							Quarter (lbs)		
District	Certificate	Pollutant	1	2	3	4	Annual (lbs)	Annual (tons)	
Placer	2001-22	PM10	1,983.08	17,125.38	12,373.08	12,243.08	43,724.62	21.86	
Placer	2001-23	NOx	2,525.00	2,525.00	2,525.00	2,525.00	10,100.00	5.05	
Placer	2001-24	PM10	7,350.00	7,350.00	7,350.00	7,350.00	29,400.00	14.70	
Placer	2001-26	VOC for NOx	6,444.62	6,444.62	6,444.62	6,444.62	25,778.46	12.89	
Yolo-Solano	EC-209 (EC-238)	NOx	0.00	2,952.00	0.00	1,518.00	4,470.00	2.24	
Yolo-Solano	EC-210	NOx	0.00	4,551.43	0.00	1,891.71	6,443.14	3.22	

Total by Pollutant						
Quarter (lbs)						
Pollutant	1	2	3	4	Annual (lbs)	Annual (tons)
NOx	8,970	16,473	8,970	12,379	46,792	23.40
PM10	9,333	24,475	19,723	19,593	73,125	36.56

# BIOLOGICAL RESOURCES

Stuart Itoga

## INTRODUCTION

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This section provides the Energy Commission staff's preliminary analysis of potential impacts to biological resources from the construction and operation of the Roseville Energy Park (REP) proposed by Roseville Electric (RE). This analysis addresses potential impacts to state and federally listed species, species of special concern, and areas of critical biological concern; describes the biological resources of the project site and at the locations of associated facilities; determines the need for mitigation and the adequacy of mitigation proposed by the applicant; and, where necessary, specifies additional mitigation measures to reduce identified impacts to less than significant levels. It also determines compliance with applicable laws, ordinances, regulations and standards (LORS), and recommends conditions of certification.

This analysis is based, in part, upon information provided in the RE Application for Certification (AFC) (Roseville 2003a), site visits, workshops, staff data requests, applicant responses (CH2MHill 2004a), a Biological Assessment (Roseville 2004b), and consultations with various agency representatives.

## LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

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### FEDERAL

- **Endangered Species Act of 1973**

Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for protection of threatened and endangered plant and animal species, and their critical habitat.

- **Migratory Bird Treaty Act**

Title 16, United States Code, sections 703-712, prohibit the take of migratory birds.

- **Clean Water Act**

33 United States Code, section 404 et seq., prohibits the discharge of dredged or fill material into the waters of the United States without a permit.

### STATE

- **California Endangered Species Act of 1984**

Fish and Game Code sections 2050 et seq., protect California's rare, threatened and endangered species.

- **Nest Or Eggs-Take, Possess, or Destroy**

Fish and Game Code section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs or any bird.

- **Birds of Prey or Eggs-Take, Possess, or Destroy**

Fish and Game Code section 3503.5, protects California's birds of prey and their eggs by making it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

- **Migratory Birds-Take or Possession**

Fish and Game section 3513 protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird.

- **Fully Protected Species**

Fish and Game Code sections 3511, 4700, 5050, 5515 prohibit take of animals that are classified as Fully Protected in California.

- **Significant Natural Areas**

Fish and Game Code section 1930 et seq. designate certain areas such as refuges, natural sloughs, riparian areas and vernal pools as significant wildlife habitat.

- **Streambed Alteration Agreement**

Fish and Game Code section 1600 et seq., require the California Department of Fish and Game to review project impacts to waterways, including impacts to vegetation and wildlife from sediment, diversions and other disturbances.

- **Native Plant Protection Act of 1977**

Fish and Game Code section 1900 et seq., designate state rare, threatened, and endangered plants.

- **California Code of Regulations**

Title 14, sections 670.2 and 670.5 list animals of California designated as threatened or endangered.

## **LOCAL**

- **Placer County General Plan**

Appendix C, Conservation Goals, Policies & Programs. Plant and Animal Communities. Biological Resource protection measures include: avoiding areas rich in wildlife or of a fragile ecological nature, maintaining fish and wildlife populations at viable levels, identifying and protecting critical habitat, reducing wetland impacts to point of no net loss, conserving upland areas adjacent to wetlands and riparian areas when they are critical to survival and nesting of wetland and riparian species, preserving habitats of rare, threatened or endangered species, and developing a comprehensive habitat management plan.

- **Placer Legacy Open Space and Agricultural Conservation Program Natural Community Conservation Plan and Habitat Conservation Plan**

Protect the diversity of plant and animal communities, including endangered and other special-status species, and establish open-space buffers between communities.

## SETTING

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### REGIONAL

The proposed REP site is located in southwestern Placer County, California. Placer County extends from the southeastern Sacramento Valley into the foothills of the Sierra Nevada Mountain Range. The proposed site is located within the Curry, Kaesberg, and Pleasant Grove Creek watersheds, within ten miles of Folsom Lake and the American River. Nearby are the cities of Roseville, Lincoln and Rocklin. Although the region is widely recognized for its vernal pool grasslands, other habitat types include annual and oak grasslands, seasonal wetlands, and riparian habitats.

The greatest regional biological resource impacts have been loss and fragmentation of wildlife habitat, including Northern Hardpan and Northern Volcanic Mudflow vernal pool grasslands. Vernal pool grasslands need to be protected because of the abundance of federally and state listed sensitive species (15 federally listed, 8 state listed) that inhabit them. In addition, the U. S. Fish and Wildlife Service (USFWS) recently designated 32,134 Placer County acres (Unit 12, West Placer Unit) as critical habitat for vernal pool species. The West Placer Unit (including the proposed REP) contains 70 percent of remaining vernal pools in Placer County (Federal Register, 2003).

Regional development is causing the loss and fragmentation of wildlife habitats, especially vernal pool grasslands. There is a large and growing body of scientific evidence that habitat fragmentation can drive plant and animal populations to extinction. For some species, loss in population is about proportional to loss of habitat (Brewer 1994). As habitat patches become smaller and farther away from each other, populations become isolated. Isolating populations reduces the exchange of genetic information between populations. Reduction in the exchange of genetic information between different populations results in inbreeding, population crashes and extinction. Habitat fragmentation is a major concern not only regionally (Placer Legacy Habitat Conservation Plan is currently being developed), but also statewide, (Hildner et al. 2003, Crooks 2002, Riley et al 2003, Leidy and White 1996, Stebbins 1985, Barry and Shaffer 1994, Jennings and Hayes 1994), nationally (Burhans and Thompson 1999, Johnson and Igl 2001, Vickery and Melvin 1994) and globally (Pertoldi et al. 2001, Tocher et al. 1997, Astorga and Farfan 2001).

The population of Placer County is rapidly increasing. It is estimated that between the years 2000 and 2025, the population of southern Placer County will double, and by 2025 total employment in southern Placer County is projected to exceed total employment in downtown Sacramento (Federal Register 2003a). Past and present development projects have impacted regional biological resources, and as population and employment increase, it seems reasonable to assume that development projects will also increase, and impacts to regional biological resources will continue.

### LOCAL

RE proposed a 40-acre project site for the project footprint and laydown areas (Roseville 2004b). The proposed REP is located directly north of the Pleasant Grove Wastewater Treatment Plant (PGWWTP). To the west of the proposed REP is a dog

kennel and to the north Pleasant Grove Creek. On the eastern border of the proposed REP is a tributary to Pleasant Grove Creek. The proposed REP, and surrounding areas, are mostly vernal pool grasslands, but some areas of the proposed site are being used for activities associated with construction of the PGWWTP (equipment cleaning, mobile offices, parking areas).

The proposed REP is located within a 70 acre parcel that provides habitat for a variety of wildlife. Historical observations of vernal pool fairy shrimp have been documented approximately one-mile northeast of the proposed REP and at the PGWWTP. A Biological Opinion (BO) issued for the PGWWTP indicated that vernal pool fairy shrimp were observed in pools on and adjacent to the PGWWTP site. California Linderiella and dwarf downingia were also documented (USFWS 1999). Vernal pool fairy shrimp were documented adjacent to the proposed REP (Roseville 2004b), and dwarf downingia documented on the proposed REP site in 2002 (URS 2002). In addition, the proposed REP provides suitable habitat to support some other sensitive plants and animals. Besides vernal pool grasslands, other natural habitat types on or in close proximity to the proposed REP include: seasonal wetland, oak woodland and riparian habitats.

Sensitive species surveys of the proposed REP and for a one-mile radius around it, as well as the proposed linear facilities routes, were conducted by RE for a previously proposed and withdrawn project. For a list of sensitive species considered for this project see **Biological Resources Table 1** below.

**Biological Resources Table 1**  
**Special Status Species Evaluated for REP**

Scientific Name Common Name	Fed/State/DFG/CNPS*	Likelihood to Occur	Observed
<i>Riparia riparia</i> (nesting) Bank swallow	-/Threatened/-/-	Low	No
<i>Falco peregrinus anatum</i> (nesting) American peregrine falcon	-/Endangered/-/-	Low	No
<i>Buteo swainsoni</i> (nesting) Swainson's hawk	-/Threatened/-/-	High	Yes
<i>Haliaeetus leucocephalus</i> (nesting and wintering) Bald eagle	-/Endangered/-/-	Moderate	No
<i>Charadrius montanus</i> Mountain plover	Proposed/SC/-/-	Low	No

<i>Grus canadensis tabida</i> (nesting and wintering) Greater sandhill crane	-/Threatened/-/-	Moderate	No
<i>Thamnophis gigas</i> Giant garter snake	Threatened/Threatened/-/-	High	No
<i>Ambystoma californiense</i> California tiger salamander	Candidate/SC/-/-	Low	No
<i>Rana aurora draytoni</i> California red-legged frog	Threatened/SC/-/-	Low	No
<i>Oncorhynchus tshawytscha</i> Central Valley spring-run chinook salmon	Threatened/Threatened/-/-	Low	No
<i>Oncorhynchus tshawytscha</i> Central Valley fall-run chinook salmon	Candidate/SC/-/-	Low	No
<i>Oncorhynchus tshawytscha</i> Winter-run chinook salmon	Endangered/Endangered/-/-	Low	No
<i>Oncorhynchus mykiss</i> Central Valley steelhead	Threatened/-/-/-	Low	No
<i>Hypomesus transpacificus</i> Delta smelt	Threatened/Threatened/-/-	Low	No
<i>Pogonichtys macrolepidotus</i> Sacramento splittail	Threatened/-/-/-	Low	No
<i>Branchinecta lynchi</i> Vernal pool fairy shrimp	Threatened/-/-/-	High	Yes
<i>Lepidurus packardi</i> Vernal pool tadpole shrimp	Endangered/-/-/-	High	No
<i>Desmocerus californicus dimorphus</i> Valley elderberry longhorn beetle	Threatened/-/-/-	High	No
<i>Gratiola heterosepala</i> Boggs Lake hedge- hyssop	--/Endangered/1B/-	Low	No
<i>Orcuttia viscida</i>	Endangered/Endangered/1B/-	Low	No

Sacramento orcutt grass			
<i>Perognathus inornatus</i> <i>inornatus</i> San Joaquin pocket mouse	SC/-/-	Low	No
<i>Myotis thysanode</i> Fringed myotis	SC/-/-	Low	No
<i>Eumops perotis</i> <i>californicus</i> Greater western mastiff bat	SC/-/SC/-	Low	No
<i>Myotis volan</i> Long-legged myotis	SC/-/-	Low	No
<i>Myotis ciliolabrum</i> Small-footed myotis	SC/-/-	Moderate	No
<i>Corynorhinus townsendii</i> <i>townsendii</i> Townsend's western big-eared bat	SC/-/-	Moderate	No
<i>Antrozous pallidus</i> Pallid bat	-/-/SC/-	Moderate	No
<i>Lasiurus blossevillii</i> Red bat	-/-/Proposed/-	Moderate	No
<i>Aquila chysaetos</i> Golden eagle	-/-/Fully Protected/-	High	Yes
<i>Agelaius tricolor</i> (nesting colony) Tricolored blackbird	SC/-/SC/-	Moderate	No
<i>Athene cunicularia</i> <i>hypugea</i> Western burrowing owl	SC/-/SC/-	Moderate	No
<i>Elanus leucurus</i> (nesting) White-tailed kite	-/-/Fully Protected/-	High	Yes
<i>Empidonax trailli</i> <i>brewsteri</i> (nesting) Little willow flycatcher	SC/-/-	Moderate	No
<i>Buteo regalis</i> (wintering) Ferruginous hawk	SC/-/-/SC	High	Yes
<i>Accipiter cooperi</i> (nesting) Cooper's hawk	-/-/SC/-	High	No
<i>Eremophila alpestris</i>	-/-/SC/-	High	Yes



Horned lark			
<i>Plegadis chihi</i> White-faced ibis	SC/-/SC/-	Moderate	No
<i>Phrynosoma coronatum frontale</i> California horned lizard	SC/-/SC, Protected/-	Low	No
<i>Clemmys marmorata</i> Northwestern pond turtle	SC/-/SC, Protected/-	Moderate	No
<i>Scaphiopus hammondi</i> Western spadefoot	SC/-/SC/-	High	No
<i>Lampetra ayresi</i> River lamprey	SC/-/SC/-	Low	No
<i>Lampetra tridentata</i> Pacific lamprey	SC/-/-/-	Low	No
<i>Acipenser medirostris</i> Green sturgeon	SC/-/SC/-	Low	No
<i>Spirinchus thaleichthys</i> Longfin smelt	SC/-/SC/-	Low	No
<i>Linderiella occidentalis</i> California linderiella	SC/-/-/-	High	No
<i>Legenere limosa</i> Legenere	SC/-/-/1B	Moderate	No
<i>Downingia pusilla</i> Dwarf downingia	-/-/-/2	High	Yes
<i>Balsamorhiza macrolepis macrolepis</i> Big-scale balsamroot	-/-/-/1B	Moderate	No
<i>Navarretia myersii myersii</i> Pincushion navarretia	-/-/-/1B	Moderate	No
<i>Cordylanthus mollis hispidus</i> Hispid bird's beak	SC/-/-/1B	Moderate	No
<i>Sagittaria sanfordii</i> Sanford's arrowhead	SC/-/-/1B	Low	No
<i>Juglans californica hindsii</i> Northern California black walnut	SC/-/-/1B	High	Yes
<i>Juncus leiospermus leiospermus</i> Red Bluff dwarf rush	-/-/-/1B	Moderate	No

\***Federal/State/DFG/CNPS** Status Abbreviations: SC= Species of Special Concern. California Native Plant Society (CNPS): 1B=Rare or endangered in California and elsewhere, 2=Rare or endangered in California, more common elsewhere. •= Surveys not conducted, assumed presence. (-) = No special status listing.

Source: Roseville Electric for the REP (Roseville 2003a), and Roseville Energy Facility (REF 2002).

## IMPACTS AND ANALYSIS

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### STAFF'S CRITERIA FOR DETERMINING IMPACT SIGNIFICANCE

The California Environmental Quality Act (CEQA) defines direct impacts as directly attributable to the project and occurring at the same time and place. Indirect impacts are caused by the project, but can occur later in time or farther removed in distance, but are still reasonably foreseeable and related to the project. Cumulative impacts are defined as those occurring when effects of the project are added to other closely-related past, present and probable future projects.

Using the aforementioned definitions, staff analyzes the potential direct, indirect and cumulative impacts to state and federally listed species, species of special concern, wetlands and other areas of critical concern. Energy Commission staff recommends conditions of certification to specify mitigation measures which help avoid or reduce impacts to biological resources to levels of insignificance. These conditions also ensure that the project owner will be in compliance with all applicable laws, ordinances, regulations and standards.

### PROJECT SPECIFIC IMPACTS

Of primary concern is the potential for construction and operation activities associated with the proposed REP to cause take of sensitive species, and the loss, degradation, and fragmentation of wildlife habitat.

#### Power Plant and Laydown Areas

RE originally proposed a 50-acre project site (Table 8.2-5, Biological Resources, Roseville 2003a). However, RE reduced the previously proposed 50 acres to 40 acres. The new proposal includes 12 acres for the power plant footprint and 24.8 acres for construction offices, laydown, and parking (Roseville 2004a). The REP footprint would abut the southern end of the proposed construction zone (see **Biological Resources Figure 1**). Although some of the proposed REP at the southern end is disturbed, most of the proposed site, and some adjacent areas are vernal pool grassland habitat designated by the U. S. Fish and Wildlife Service (USFWS) as critical habitat for the vernal pool fairy shrimp.

Wildlife surveys were conducted by RE during July and August 2003 (Roseville 2003a). Other wildlife surveys of the proposed REP and adjacent areas were conducted for a previously proposed power plant (REF 2002). Additional sampling for vernal pool branchiopods was conducted in October 2003 (dry season). Results of dry season branchiopod surveys showed that *Branchinecta* sp. cysts were present in some pools located on the site and adjacent areas. Vernal pool fairy shrimp presence (*Branchinecta lynchi*) was confirmed during wet season presence/absence surveys

conducted in December and February 2004. Swainson's hawks, northern harriers, and white-tailed kites have been observed foraging at the proposed site (Itoga, pers. obs.).

Constructing the REP would require filling and grading vernal pools/swales and adjacent uplands (Roseville 2003a). Construction of the power plant footprint, laydown, and parking areas would cause the loss and degradation of vernal pool fairy shrimp habitat and would likely cause take of vernal pool fairy shrimp. However, grading and gravelling some areas for use as parking and laydown areas, would affect more than just the vernal pool fairy shrimp and its habitat. By permanently removing some features of the vernal pool landscape and altering others, construction activities would also adversely affect the topography and hydrology of the site and some adjacent areas. In addition to potential direct and indirect adverse impacts to vernal pool fairy shrimp and vernal pool fairy shrimp habitat, some other sensitive species protected under the federal/state endangered species acts could be potentially affected by construction and operation of the project.

### **Upland Impacts**

Vernal pools in California tend to occur in clusters called complexes. A landscape that supports a vernal pool complex is typically grassland (uplands) with areas of obstructed drainage that form pools (Federal Register 2003). Maintaining the integrity of uplands influences not only the hydrology of vernal pools but also the likelihood of maintaining some characteristic pool fauna and interactions among species. Upland habitat adjacent to, and within, a vernal pool complex, or vernal pool grassland, is essential to the hydrological and biological integrity of the complex (USFWS 1996). In assessing critical habitat for the vernal pool fairy shrimp, the USFWS determined that habitat within Unit 12 (including the REP) has the physical attributes (including uplands) necessary for the survival and recovery of the fairy shrimp (Federal Register 2003). Viability of vernal pool ecosystems depends on maintaining more than just areas that fill with water. The upland component of vernal pool grassland ecosystems supports the wetland component (Smith and Verrill 1998, Hanes and Stromberg 1998, Silveira 1998), and wetlands (including vernal pool systems) are naturally dynamic ecosystems physically bound by site-specific hydrologic and geomorphic controls. Thus the functional properties of wetlands are determined largely by their hydrogeomorphic context (Leidy and White 1998), but in addition to their role in the form and function of the vernal pool landscape, the upland component of vernal pool grasslands provides other important functions.

Besides supporting the wetland component of the vernal pool grassland ecosystem, uplands are essential to the health of vernal pool grasslands and wildlife populations. For example, various bee species utilize uplands adjacent to vernal pools for nesting. Bees provide a mechanism for pollinating plants within and between vernal pool grassland, and other habitats. Vernal pool grasslands provide important foraging, roosting, and breeding habitat for raptors, waterfowl, shorebirds, and passerines. Migrating waterfowl and shorebirds, utilizing vernal pool grasslands, transport dormant seeds and eggs of vernal pool organisms from one location or region to another, either internally in food, or attached in mud to their legs or feathers (Wolf et al. 1998). These types of interactions help the exchange of genetic information necessary to maintain healthy wildlife populations within vernal pool grasslands. As habitat is lost and/or

fragmented, the exchange of genetic information between populations becomes difficult (in cases of isolated populations, impossible). Lack of genetic diversity can lead to inbreeding, population crashes and extinction.

RE indicated that 5.8 acres of annual grasslands would be permanently affected by grading and filling for the proposed power plant footprint. RE also indicated that grading and gravelling other areas for use as laydown and parking areas would temporarily affect another 20.7 acres of annual grasslands. RE proposed restoration of annual grassland areas (20.7 acres) potentially used for laydown and worker parking areas. The total acreage of potentially affected uplands would be 26.5 acres (Roseville 2004b).

In staff's opinion, the annual grasslands, as defined by RE, are the upland component of the vernal pool grassland ecosystem located on the proposed REP. This vernal pool grassland extends well past the proposed REP. With the exception of the PGWWTP, the surrounding landscape is mostly open space. Construction of the proposed power plant would remove and alter the uplands on the site. Construction and operation of the REP, would establish new physical boundaries which would divide the vernal pool landscape and create smaller habitat patches. In staff's opinion, this would be habitat fragmentation, and would make the exchange of genetic material between populations more difficult by increasing distance, and creating barriers between populations. In addition, grading and filling uplands would alter the hydrology and topography of the system. This would have an adverse impact on the function of the vernal pool ecosystem by altering the site-specific mechanism through which water is distributed over and through the system.

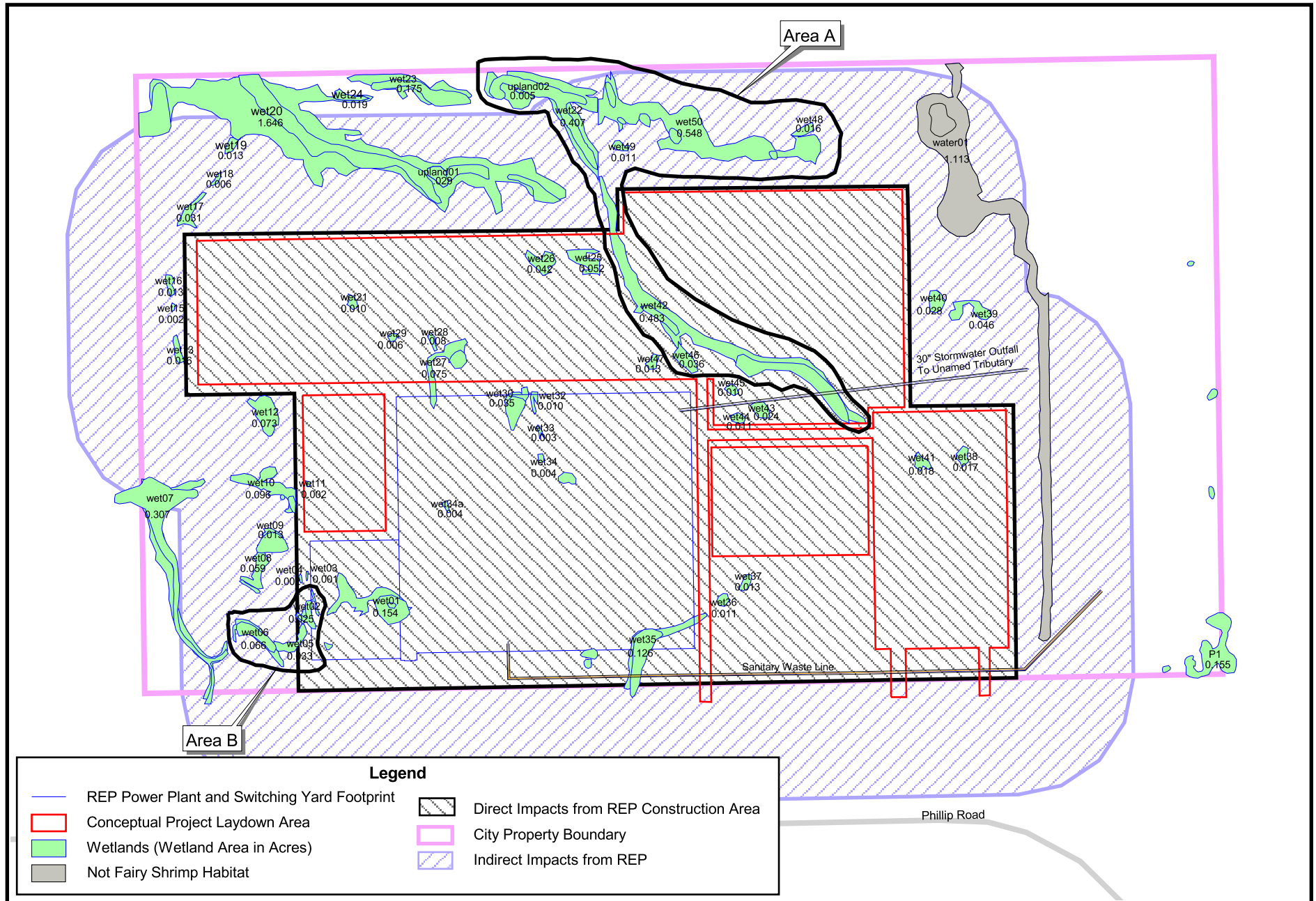
Construction and operation of the REP would also cause the loss, fragmentation and degradation of upland foraging habitat used by a variety of wildlife, including the Swainson's hawk. California Natural Diversity Database (CNDDDB) (CDFG 2004) records indicate that there are two active Swainson's hawk nests within the Pleasant Grove Creek riparian area. The nests are within two miles of the proposed REP. California Department of Fish and Game (CDFG) mitigation guidelines suggest replacement habitat (for nests within five miles of project, but greater than one-mile), at a ratio of 0.75 acre for every one-acre of foraging habitat affected, or other project specific measures (CDFG 1994).

By causing the loss, degradation, and fragmentation of upland habitat, construction and operation of the proposed REP would have potential direct, adverse impacts to sensitive species observed on or near the proposed project site (USFWS 1999, URS 2002, CNDDDB 2003, Itoga pers obs.). Including the Swainson's hawk, sensitive species observed on or near the REP were:

- Western spadefoot (federal and state species of concern);
- Dwarf downingia (CNPS list 2);
- Swainson's hawk (federal species of concern, state threatened);
- White-tailed kite (state fully protected);

# BIOLOGICAL RESOURCES - FIGURE 1

Roseville Energy Park - Direct and indirect impacts to wetlands and vernal pool fairy shrimp habitat.



- Northern harrier (state species of concern);
- Burrowing owl (federal and state species of concern);
- Vernal pool fairy shrimp (federally threatened);
- Golden eagle (state fully protected);
- Horned lark (state species of concern); and
- Ferruginous hawk (federal and state species of concern).

Also protected under the federal/state endangered species acts are some species that could potentially occur on the proposed project site. Although no observations for the species have been recorded in the CNDDDB, suitable habitat exists on the site to support them. Species potentially affected indirectly by construction and operation of the REP are:

- Stinkbells (federal species of concern, CNPS list 4);
- Bogg's Lake hedge hyssop (federal species of concern, state endangered, CNPS list 1B);
- Red Bluff dwarf rush (federal species of concern, CNPS list 1B);
- Pincushion navarretia (federal species of concern, CNPS list 1B);
- Legenere (federal species of concern, CNPS list 1B);
- Big-scale balsamroot (federal species of concern, CNPS list 1B);
- Lawrence's goldfinch (federal species of concern);
- Cooper's hawk (state species of concern);
- Bald eagle (state endangered);
- Oak titmouse (federal species of concern);
- Western pond turtle (federal and state species of concern);
- Giant garter snake (federal and state threatened);
- Vernal pool tadpole shrimp (federal endangered); and
- California tiger salamander (federal candidate for listing, state species of concern).

There were various sensitive wildlife species observed on or near the proposed REP (including nesting Swainson's hawks), or that could potentially utilize habitat on the proposed REP, requiring protection for continued survival/recovery. In staff's opinion, REP construction and operation would reduce the amount of habitat, create smaller patches of habitat, and degrade the quality of habitat available to these species. In addition to the permanent loss of 5.8 acres of uplands caused by construction of the proposed project footprint, upland areas proposed for use as laydown/parking areas (24.8 acres) would be graded and graveled and therefore, unavailable for use by wildlife during construction.

In the context of the proposed REP, as an integral part of a larger vernal pool grassland system, RE's proposal to restore uplands would not replace the function of the existing vernal pool grassland, or its value to wildlife. It is likely that there would be a loss of species diversity associated with construction of the proposed REP and with the proposed restoration of uplands. Disturbed areas rarely are successfully restored without careful planning and aggressive adaptive management (Tilman and Downing 1994), and in staff's opinion it is also unlikely that potential impacts to existing wildlife populations would be mitigated by replacement of only one component of the complex ecosystem located on the proposed REP and adjacent areas. Furthermore, because of the proximity of the proposed power plant to areas proposed for restoration, it is logistically infeasible that on-site restoration of upland habitat could be effectively managed (e.g. controlled burns, cattle grazing) for the preservation or recovery of any of the sensitive species directly or indirectly affected by the proposed REP. In addition, construction and operation of the proposed power plant/laydown areas would permanently alter the topography of the proposed site and the hydrology of some adjacent areas. Construction of the proposed REP would create smaller habitat patches within the 40-acre site, leaving small islands of marginal habitat available for wildlife. This potential fragmentation of critical sensitive species habitat would likely contribute to reduced exchange of genetic information between local populations, leading to inbreeding and possible local extinctions. For the aforementioned reasons, and after informal consultations with staff from CDFG (J. Finn pers. comm.), and USFWS (R. Kuyper pers. comm.), staff concluded that impacts to uplands associated with construction of the proposed REP laydown/parking areas are not temporary. Proposed construction activities would have direct and indirect adverse impacts to 26.5 acres of upland habitat. However, staff has proposed Biological Resources Condition of Certification **BIO-14** to mitigate potential upland impacts to levels less than significant.

### **Wetland Impacts**

RE's wetland delineation has not been verified by the U.S. Army Corp of Engineers (USACE). The verified delineation will be used to calculate the project's potential impacts to vernal pool fairy shrimp habitat and waters of the U.S. under USACE jurisdiction. It is not known how changes to the delineation would affect wetland impact acreage estimates.

Although staff has yet to review the verified wetland delineation, available data was analyzed (Roseville 2004a). Staff calculated direct impact to fairy shrimp habitat as 2.3 acres and indirect impacts as 2.4 acres. However, RE considered seasonal wetlands separate from fairy shrimp habitat, and calculated direct impacts to seasonal wetlands as 1.2 acres and direct impacts to fairy shrimp habitat as 0.72 acres. RE calculated indirect impacts to seasonal wetlands as 2.6 acres and indirect impacts to fairy shrimp habitat as 1.6 acres (Roseville 2004b).

Differences in staff and RE's wetted acre calculations are due to the delineation of two wetted areas, staff is including the potential indirect impact to fairy shrimp habitat, associated with construction of the proposed Sanitary Waste Line (0.16 acre indirect), and the definition of vernal pool fairy shrimp habitat. It seems apparent from site visits, informal consultations with USFWS (R. Kuyper pers. comm., K. Fuller pers. comm.) and USACE (J. Cutler pers. comm., W. Ness pers. comm.) staff, and review of wetland

delineations, that most of the site is hydrologically connected. It is the opinion of staff that the majority of the proposed project site, and some areas beyond it, are hydrologically connected. Pools designated separately ( see **Biological Resources Figure 1**) as wet 22, 42, 46, 48, and 50 (Roseville 2004a) are one continuous pool (area A). Wet 2, 5, and 6 are one pool as well (area B). Because portions of both area A, and area B would be directly impacted by construction of the proposed REP, and because both area A and area B are continuous pools, the entire wetted areas of A and B, by definition of the USFWS, would be considered directly impacted (Nagano 2001).

Indirect impacts to critical fairy shrimp habitat would occur from the proposed REP site (Roseville 2004a), extending out for a distance of 250 feet (see **Biological Resources Figure 1**). As with direct impacts, if any part of a pool/swale is affected by indirect project activities, the entire pool is considered affected (Nagano 2001). Using the USFWS definition of direct and indirect impacts to calculate potential impacts, construction and operation of the proposed project would indirectly affect 4.6 acres of vernal pool fairy shrimp habitat.

Regarding wetland/fairy shrimp habitat definitions, vernal pools/swales are fairy shrimp habitat, and vernal pools/ swales are subsets of wetlands. In staff's opinion, areas defined as seasonal wetlands by RE, are fairy shrimp habitat. Furthermore, the proposed REP, and adjacent areas, are within designated critical habitat for the vernal pool fairy shrimp. After a review and public comment period, the USFWS determined that habitat within Unit 12 (including the proposed REP and adjacent areas) has the physical attributes necessary for the survival and recovery of the fairy shrimp (Federal Register 2003).

Vernal pools usually exist in complexes and may be fed or connected by low drainage pathways called swales. Swales are often themselves seasonal wetlands that remain saturated for much of the wet season, but may not be inundated long enough to develop strong vernal pool characteristics (Federal Register 2003). Water is retained in pools and swales because of underlying layers of impermeable material such as: claypan, hardpan, or non-volcanic rock (Chetham 1976, Weitkamp et al. 1996). Pool and swale inundation occurs in winter and/or spring with desiccation beginning once the rainy season is over (late spring and early summer). Variations in rainfall affect the duration of pools and swales (vernal pool complexes may undergo more than one cycle of inundation and desiccation in a single season).

Dry season surveys conducted by RE indicated *Branchinecta* sp. cysts were present in 11 of 30 basins sampled on the proposed project site and some adjacent areas. Dry season sampling was conducted to determine if cysts of vernal pool branchiopods were present on the proposed project site. Cysts are the dormant life stage of vernal pool branchiopods (a classification which includes the vernal pool fairy shrimp). The cysts are able to withstand extreme environmental conditions enabling them to remain viable for many years. Although exact environmental cues necessary to trigger hatching of fairy shrimp cysts are unknown, it is known that a limited temperature range and inundation of habitat are two factors that are needed for hatching to begin; however, cysts in a given area do not all hatch at the same time. Cysts usually begin hatching in late winter and continue into late spring, once habitat begins to dry up. Fairy shrimp habitat may dry out and become inundated more than once in a single season, and fairy



shrimp cysts can hatch during any appropriate cycle of inundation (Eriksen and Belk 1999). Although the cysts were identified to genus level, the cysts were not cultured to allow identification to species level. Instead, wet season surveys were conducted by RE on December 23, 2003, and January 6, 20, and 27, 2004. Results of wet season sampling indicated that vernal pool fairy shrimp (*Branchinecta lynchi*) were present in wetland P1 (southeast corner), outside the proposed REP (see **Biological Resources Figure 1**). However, the intent of the wet season survey was not to obtain a population estimate for vernal pool fairy shrimp, but rather to establish presence or absence of vernal pool fairy shrimp on the proposed project site and adjacent areas potentially affected by the proposed REP (Helm pers. comm.).

Given the historical records of vernal pool fairy shrimp documented close to the proposed project site (at the PGWWTP), the designation of critical habitat for vernal pool fairy shrimp in west Placer County (including the proposed REP), the presence of *Branchinecta* sp. cysts in 37 percent of basins sampled on the proposed REP site, staff's assessment of habitat on the proposed project site, informal consultations with staff from CDFG (J. Finn pers. comm.), USFWS (R. Kuyper pers. comm.), and USACE (W. Ness pers. comm.), and the confirmed presence of *B. lynchi* immediately adjacent to the proposed REP, staff considers the proposed REP and adjacent areas to be vernal pool fairy shrimp habitat. For the aforementioned reasons, staff concludes that construction and operation of the proposed REP would result in habitat loss and fragmentation. Grading and filling the proposed REP for the power plant footprint, laydown, and parking areas would cause direct, adverse impacts to 2.2 acres of vernal pool fairy shrimp habitat, and indirect adverse impacts to 4.6 acres of vernal pool fairy shrimp habitat. In addition, take of vernal pool fairy shrimp is likely. However, staff has proposed Biological Resources Condition of Certification **BIO-13** to reduce potential impacts to vernal pool fairy shrimp, and vernal pool fairy shrimp habitat to levels less than significant.

## **Linear Facilities**

### **Natural Gas Pipeline**

RE's proposed natural gas pipeline would originate from a Pacific Gas and Electric pipeline near Country Club Drive. The pipeline would be approximately 6 miles long. It would be routed beneath Baseline Road to the east before being routed north beneath Fiddymment Road. At the intersection of Fiddymment Road and Blue Oaks Boulevard, the pipeline would be routed generally west across what is currently open space. Construction of the pipeline within this open-space area would impact vernal pool grasslands, riparian areas and would require crossings of Curry and Kaseberg Creeks. Crossings of unnamed tributaries to Pleasant Grove and Kaseberg Creeks would also be required. Impacts associated with construction and operation of the gas pipeline from the end of existing Blue Oaks Boulevard to the eastern boundary of a 70-acre parcel owned by the City of Roseville have been permitted through the WRSP Environmental Impact Report process.

The proposed natural gas pipeline would enter the proposed REP at its northeast corner. From this point, the pipeline would be routed south for approximately 1,200

feet, and then west for approximately 600 feet before terminating at the proposed power plant footprint.

The areas potentially affected by the proposed pipeline would be constructed within areas considered directly and indirectly affected by construction of the proposed project footprint, laydown and parking areas. Impacts to biological resources within these areas have been considered in the Power Plant and Laydown Areas section, and staff has proposed Biological Resources Conditions **BIO-13**, and **BIO-14** to mitigate potential impacts to levels less than significant. So long as impacts associated with construction of the proposed REP footprint, laydown, and working areas are fully mitigated, staff would not consider construction of the natural gas pipeline within the proposed area as an additional, significant impact.

### **Transmission Line**

RE indicated that the proposed REP would connect with a 60 kV double-circuit transmission line after annexation of West Roseville.

To connect the proposed REP to the 60 kV double-circuit transmission line, RE proposed a 100-foot long, 60 kV transmission line. The proposed transmission line would be constructed entirely within the REP switchyard (Roseville 2003a). The proposed switchyard would occupy 1.8 acres on the southeast side of the REP. Impacts to biological resources associated with construction of the proposed switchyard were assessed in staff's analysis of the power plant and laydown areas. Staff concluded that adverse impacts to biological resources were likely to be caused by construction of the switchyard, and proposed Conditions of Certification **BIO-13**, and **BIO-14** to mitigate potential impacts to levels less than significant. Staff assessed the proposed 100-foot section of transmission line for potential impacts to birds from electrocution. RE indicated (Roseville 2003a) that the transmission line towers would be constructed using Public Utilities Commission (PUC) rules for overhead line construction (PUC 1981). In addition, staff reviewed proposed tower designs and concluded that the proposed towers would meet Avian Power Line Interaction Committee (APLIC) standards for preventing bird electrocutions (APLIC 1996). It is staff's opinion that bird electrocutions associated with the proposed 100-foot transmission line are unlikely.

Staff also assessed the potential for bird strikes with the proposed REP transmission line. The transmission line would be constructed within the proposed REP switchyard. Turning towers approximately 65 feet tall have been proposed. These towers would be the tallest structures associated with the REP transmission line. Avian collisions with these structures are possible; however, a height of 65 feet is considered relatively low risk for bird collisions, as most documented bird collision deaths are associated with migrating passerines and facilities ranging from 500 to 650 feet high (Goodwin 1975, Maehr et al. 1983, Weir 1974, Zimmerman 1975). Although raptors have been observed foraging over the proposed site, it does not appear to be in the flight path of migratory birds.

In assessing bird strikes with transmission lines, lighting should be considered as a factor in attracting birds toward structures. REP lighting however, would be shielded to direct light downward (City of Roseville 2003), reducing the risk of bird attraction.

Because the proposed transmission line would be constructed to APLIC standards for preventing bird electrocutions, staff concludes that the proposed transmission line would not pose a significant risk of electrocution to birds in the proposed project area. Staff also concludes that the proposed transmission line does not pose a significant collision hazard to birds in the proposed project area.

### **Recycled Water Pipeline**

For cooling and process water, REP will use wastewater obtained from the PGWWTP. To supply the wastewater, a pipeline connecting the REP to the PGWTP has been proposed. The proposed pipeline would be 0.1-mile long and would be routed beneath Phillip Road. The PGWTP has been permitted and is almost complete; therefore, because the PGWTP is an already disturbed area, staff does not anticipate any adverse impacts to biological resources on the PGWTP site. From the PGWWTP site, the proposed pipeline would be routed beneath an existing section of Phillip Road. Because this is an existing section of roadway, staff considers this area to be already disturbed and of little value to wildlife, and staff does not anticipate any adverse impacts to biological resources associated with construction of the recycled water pipeline beneath Phillip Road. The area where the sanitary sewer pipeline would traverse the proposed project site is also a disturbed area and staff does not anticipate any adverse impacts to biological resources associated with construction of the recycled water pipeline in this area. Construction of the proposed recycled water pipeline would occur in already disturbed areas; therefore, staff concludes that construction of the proposed recycled water pipeline is not likely to adversely impact biological resources on the proposed project site or adjacent areas.

### **Sanitary Sewer Pipeline**

RE proposed 800 feet of sanitary sewer pipeline to connect the proposed project to the PGWTP lift station. The sanitary sewer line would traverse the southern border of the proposed 40-acre project site. Potential impacts associated with the proposed sanitary sewer line were considered in the Power Plant and Laydown Areas section. To mitigate potential impacts associated with construction of the power plant, laydown, and parking areas, staff proposes Biological Resources Conditions of Certification **BIO-13**, and **BIO-14**. The proposed line would extend approximately 250 feet outside of the proposed 40-acre site. Although some of this area is already disturbed, it appears that constructing the sanitary sewer pipeline would cause disturbance to an area within 250 feet of vernal pool fairy shrimp habitat (see Biological Resources **Figure 1**, wetland P1). Although the terminal end of the proposed sanitary sewer line appears to be outside the 250 foot indirect impact zone illustrated in Biological Resources **Figure 1**, closer examination indicated that construction of the pipeline within this area would be within 250 feet of a confirmed vernal pool fairy shrimp population (Roseville 2004b). Construction of the sanitary sewer pipeline would potentially disturb an area within 250 feet of vernal pool fairy shrimp and habitat. This would be considered an indirect impact by the USFWS (Nagano 2001, R. Kuyper pers. comm.). Because the proposed pipeline would disturb an area within 250 feet of known fairy shrimp occurrence (see **Biological Resources**

**Figure 1, wetland P1)** (Helm pers. comm.), staff concludes that construction of the pipeline, outside the proposed 40-acre site, would be an indirect adverse impact to vernal pool fairy shrimp and 0.16 acre of vernal pool fairy shrimp habitat. To mitigate this potential impact to a level less than significant, staff has proposed Biological Resources Condition of Certification **BIO-13**.

### **Stormwater Outfall**

RE has proposed a 720-foot stormwater outfall as part of the proposed project. The proposed outfall would be routed west from the northeast corner of the power plant footprint to its discharge point, an unnamed north-south tributary to Pleasant Grove Creek. Most of the potential impacts associated with construction of the outfall have been considered in the Power Plant and Laydown Areas Section, and staff has proposed Biological Resources Conditions of Certification **BIO 13**, and **BIO-14** to reduce potential impacts to levels less than significant; however, a 270-foot section of the outfall would be constructed outside the proposed REP construction zone. RE indicated that this section of the proposed outfall would permanently impact 0.3 acre of grassland.

The proposed section of stormwater outfall that would extend outside the REP construction zone would still be within the 250 foot indirect impact zone illustrated in **Biological Resources Figure 1**. Furthermore, construction of the proposed outfall appears to be within 250 feet of vernal pool fairy shrimp habitat (wet 39 and wet 40) and could potentially affect 0.07 acre of vernal pool fairy shrimp habitat. Therefore, construction of the outfall would be considered an indirect impact to vernal pool fairy shrimp habitat as well as a direct impact to upland habitat. However, construction of most of the outfall would be considered under the analysis for the power plant and laydown areas and would not be considered an indirect impact separate from the indirect impacts associated with construction of the power plant footprint, laydown, and parking areas. Staff has proposed Biological Resources Condition of Certification **BIO-13**, to mitigate impacts to fairy shrimp, and habitat, caused by construction of the power plant footprint and laydown areas to levels less than significant. Regarding potential upland impacts, staff has proposed Biological Resources Condition of Certification **BIO-14** to reduce impacts to uplands to levels less than significant.

## **CUMULATIVE IMPACTS**

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Cumulative impacts refer to two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact of several projects is the change in the environment that results from the incremental impact of the project when added to other, closely related past, present, or reasonably foreseeable, probable future projects.

The proposed REP would contribute, incrementally, to the loss and fragmentation of wildlife habitat, including designated critical habitat for the vernal pool fairy shrimp, in western Placer County. The proposed projects potential incremental contribution to the loss and fragmentation of wildlife habitat when considered together with potential impacts of the WRSP would be potentially significant.

The City of Roseville, as lead agency for the West Roseville Specific Plan, submitted an Environmental Impact Report (EIR) for the proposed development project that would amend 5,527 acres west of the City of Roseville and place it within the City's sphere of influence (SOI). Within the proposed SOI, would be the 3,162 acre West Roseville Specific Plan (WRSP) and two remainder areas totaling 2,365 acres. The WRSP did not include proposals to develop the remainder areas, but development could occur at some time in the future. The WRSP proposes conversion of 360 acres of open-space to a mixture of high and low density housing, light industrial, parks, schools, and open-space. Implementing the WRSP would affect a variety of biological resources. Wildlife habitats that would be affected by the Plan include vernal pool grasslands, and riparian areas. Because implementation of the WRSP would impact biological resources, mitigation measures were required by the USFWS, USACE, and CDFG.

Included in the WRSP were proposals for a transmission line and natural gas pipeline. The majority of the transmission and natural gas pipelines were permitted. However, no impacts to biological resources located on a 70-acre City of Roseville property (the proposed 40-acre REF project site would be located within this parcel) were included or assessed in the WRSP EIR. Therefore, the impacts associated with the roads and linears that would traverse the proposed REP site have not yet been permitted. Two road extensions associated with the WRSP would contribute to the loss and fragmentation of habitat on the proposed project site: Phillip Road and Blue Oaks Boulevard. The Phillip Road extension would bisect the proposed REP project site at the east side, traversing the site in a north-south direction. The Blue Oaks Boulevard extension would not traverse the proposed REP site but would traverse the northern boundary of the 70-acre city of Roseville parcel within which the REP would be located.

Because of the incremental contributions of projects in the immediate vicinity of the proposed REP, and the similarity in the species affected, or potentially affected, it is staff's opinion that the proposed REP would contribute incrementally and cause potential adverse cumulative impacts to vernal pool grasslands, and the following species known from the proposed project area:

- Western spadefoot (federal and state species of concern);
- Dwarf downingia (CNPS list 2);
- Swainson's hawk (federal species of concern, state threatened);
- White-tailed kite (state fully protected);
- Northern harrier (state species of concern);
- Burrowing owl (federal and state species of concern);
- Vernal pool fairy shrimp (federally threatened);
- Golden eagle (state fully protected);
- Horned lark (state species of concern); and
- Ferruginous hawk (federal and state species of concern).

In addition, the proposed REP would also cause adverse cumulative impacts to the following species with potential to occur in the proposed project area:

- Stinkbells (federal species of concern, CNPS list 4);
- Bogg's Lake hedge hyssop (federal species of concern, state endangered, CNPS list 1B);
- Red Bluff dwarf rush (federal species of concern, CNPS list 1B);
- Pincushion navarretia (federal species of concern, CNPS list 1B);
- Legenere (federal species of concern, CNPS list 1B);
- Big-scale balsamroot (federal species of concern, CNPS list 1B);
- Lawrence's goldfinch (federal species of concern);
- Cooper's hawk (state species of concern);
- Bald eagle (state endangered);
- Oak titmouse (federal species of concern);
- Western pond turtle (federal and state species of concern);
- Giant garter snake (federal and state threatened);
- Vernal pool tadpole shrimp (federal endangered); and
- California tiger salamander (federal candidate for listing, state species of concern).

Considering past projects with like impacts (PGWWTP), and reasonably foreseeable future projects with like impacts (WRSP), it is staff's opinion that the proposed REP would contribute incrementally to adverse sensitive species impacts, habitat loss, degradation, and fragmentation.

The PGWWTP is located immediately south of the proposed REP. Sensitive species documented on the site included vernal pool fairy shrimp and dwarf downingia (USFWS 1999). Reasonably foreseeable impacts to species including: vernal pool fairy shrimp, Swainson's hawk, and dwarf downingia would be caused by implementation of the WRSP (A. Rosler, pers. comm., J. Finn pers. comm.). In addition, the PGWWTP has contributed incrementally to habitat fragmentation, as would the WRSP. The PGWWTP was constructed on vernal pool grasslands, contributing to loss and fragmentation of habitat. Development planned for the WRSP would be constructed in close proximity to the proposed REP and some of this development would occur on vernal pool grasslands, incrementally contributing to loss and fragmentation of this habitat. Further compounding habitat fragmentation on the proposed REP, would be proposed WRSP road extensions which would parallel the REP's northern border and bisect the proposed REP site towards its east side.

Because of similarities in the species affected, or potentially affected, and the incremental contributions of the PGWWTP and WRSP to habitat loss, fragmentation, and degradation, and when considered together with potential impacts associated with the proposed REP, staff concludes that the proposed REP would contribute

incrementally to the loss and fragmentation of vernal pool grasslands and would also contribute, incrementally, to adverse impacts to the sensitive species listed above. While it is staff's conclusion that the proposed REP would cause adverse cumulative impacts, Biological Resources Conditions of Certification **BIO-13**, and **BIO-14** that staff has proposed would reduce potential cumulative impacts to levels less than significant.

## MITIGATION

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RE proposed general mitigation measures for potential impacts to Central Valley steelhead, chinook salmon, vernal pool crustaceans, dwarf downingia, western spadefoot, Swainson's hawk, and white-tailed kite. In addition, RE proposed habitat compensation for potential impacts to vernal pool fairy shrimp habitat, Swainson's hawk and white-tailed kite. Staff agrees with the general mitigation measures (trash removal, Best Management Practices etc.) proposed by RE (Roseville 2003a). However, it is staff's opinion that habitat compensation proposed by RE would not mitigate potential direct and indirect impacts to vernal pool fairy shrimp critical habitat, vernal pool grasslands, and sensitive species to levels less than significant.

The proposed project site is within critical habitat (West Placer, Unit 12) for the federally threatened vernal pool fairy shrimp (*Branchinecta lynchi*), and the proposed project would adversely impact critical vernal pool fairy shrimp habitat within West Placer Unit 12. Critical habitat is defined as a specific geographic area that is essential for the conservation of a threatened or endangered species and that may require special management or protection (Endangered Species Act 1973). In designating Unit 12 as critical habitat, the USFWS determined that habitats within Unit 12 boundaries (including the proposed project site) possess the appropriate combination of climate, soil, and topography, over continuous areas, (within western Placer County), to support the survival and recovery of vernal pool fairy shrimp (Federal Register 2003). Because critical habitat within Unit 12 (West Placer County unit) would be adversely impacted by the proposed project, any habitat compensation proposed by RE would need to have like characteristics (i.e. climate, soil, topography) as Unit 12 habitat potentially affected by the project. In addition, because take of the vernal pool fairy shrimp is likely, any replacement habitat would need to have vernal pool fairy shrimp presence. Because RE indicated that some potential impacts to vernal pool fairy shrimp could not be avoided, and on-site mitigation is not possible, in staff's opinion, the most feasible way of providing habitat with similar characteristics as the proposed site's habitat, would be to provide habitat close to the proposed project area.

In addition to meeting the requirements of the USFWS, the USACE would likely require creation of wetlands, within the Pleasant Grove Creek Watershed, separate from mitigation required by USFWS. Because the potential impacts to jurisdictional wetlands will likely be greater than one-acre, payment of an in-lieu fee to the USACE as mitigation for wetland impacts would probably not be an option. Furthermore, payment of an in-lieu fee to the USFWS for potential impacts to fairy shrimp habitat would not satisfy the requirements of the USACE, and if this option is pursued, separate mitigation would be required by the USACE.

The USACE will not be able to assess potential impacts, and any required mitigation, until RE's wetland delineation is verified and an application for a 404 permit is submitted. Therefore, preliminary mitigation proposed by staff could not include requirements of the USACE. However, informal consultation between staff and USACE (W. Ness pers. comm.) indicated that the wetland mitigation requirements of the USACE could be met under habitat compensation proposed to staff and the USFWS for impacts to vernal pool fairy shrimp and vernal pool grasslands provided that agency staff find any proposed compensation adequate to mitigate potential wetland impacts.

The project's potential impacts to vernal pool grasslands are greater than one-acre; therefore, the project would not qualify for a programmatic consultation with USFWS. Mitigating vernal pool impacts in Placer County is difficult because of the lack of banks with sufficient vernal pool credits. Furthermore, any new banks issuing credits for wetlands/federally listed species would need to be approved by the USFWS and USACE. Approval of new banks can be a lengthy process, but staff has consulted with the Center for Natural Lands Management (CNLM) (Sherry Theresa pers. comm.) and USFWS (Susan Hill pers. comm.) concerning the purchase, and USFWS approval, of vernal pool grassland habitat compensation in Placer County. This may be an option RE may choose to pursue. However, if RE decides to investigate this option, it should be noted that locating an acceptable parcel would be the responsibility of RE.

Once it is determined that potential impacts are fully mitigated, the USFWS would likely issue an incidental take permit to the project owner; however, USACE does not issue permits for take of federally listed species. Instead, the USACE regulates wetland fill and enforces a no-net-loss of wetlands policy. Informal consultation with the USACE (W. Ness pers. comm.) indicated that the wetted acres on the proposed project site, and adjacent City of Roseville property are jurisdictional wetlands. Although the wetted acreage amounts will be the same regardless of how they are defined (fairy shrimp habitat or seasonal wetlands, with the exception of water 01, and wet 07 see **Biological Resources Figure 1**), mitigation required by USFWS and USACE will differ. Until a wetland delineation is verified, and 404 permit application is submitted, no analysis of impacts to jurisdictional wetlands can be completed.

## **Applicant Proposed Habitat Compensation**

### **Wetlands**

RE proposed to obtain credits at an off-site mitigation bank at ratios of 2:1 preservation and 1:1 creation. For direct impacts to 0.72 acres obtain 1.44 acres of preservation credits (2:1) and 0.72 acres of creation credits (1:1). For indirect impacts to 1.64 acres, obtain 3.28 acres preservation credits (2:1). See **Biological Resources Table 1**.



**Biological Resources Table 1**  
**RE's Proposed Wetland Mitigation**

	<b>Direct Impact</b> (preservation and creation)	<b>Indirect Impact</b> (creation only)
<b>Impact</b>	<b>0.7 acre</b>	<b>1.6 acre</b>
<b>Preservation Ratio</b> (2 : 1)	0.7 x 2 = 1.4 acres	
<b>Direct Impact Creation Ratio</b> (1:1)	0.7 x 1 = 0.7 acres	
<b>Indirect Impact Creation Ratio</b> (2:1)		1.6 x 2 = 3.3 acres

Source: Roseville 2003a.

As illustrated in **Biological Resources Table 1** above, RE proposed to preserve 1.4 acres of habitat for direct impacts (0.7 acre x 2), and create 4.0 acres of habitat for indirect impacts (0.7 x 1 + 1.6 x 2).

### **Staff Proposed Habitat Compensation**

#### **Wetlands**

Staff agrees with the 2:1 preservation and 1:1 creation ratios proposed for direct impacts to vernal pool fairy shrimp habitat, but staff does not agree that the proposed project would directly impact 0.72 acre and indirectly impact 1.64 acres of fairy shrimp habitat. As previously discussed, staff and the USFWS (R. Kuyper pers. comm.) will use the USACE verified wetland delineation for final determination of potential impacts to vernal pool fairy shrimp habitat.

Staff does not agree with RE's mitigation proposal based on a programmatic consultation. The proposed REP impacts to vernal pools/swales would be greater than one- acre thereby disqualifying the project for programmatic consultation. In addition, because the potential impacts to fairy shrimp habitat would be greater than 1 acre, the ratio for indirect impacts would be 3:1 preservation only. Based on informal consultation with the USFWS (R. Kuyper pers. comm.), staff proposes RE use standard USFWS mitigation ratios for direct and indirect impacts to vernal pool fairy shrimp habitat. USFWS mitigation ratios specify, for direct impacts: creation of vernal pools at a ratio of 1:1, or 1 acre of created habitat for every acre of habitat affected, and preservation of vernal pools at a 2: 1 ratio, or preservation of 2 acres of vernal pools for every 1 acre affected. For indirect impacts: No preservation is required, but creation at 3:1, or 3 acres of habitat created for every acre affected, is necessary. See **Biological Resources Table 2** for staff's proposed wetland mitigation.

**Biological Resources Table 2  
Staff's Proposed Wetland Mitigation**

	<b>Direct Impact</b> (preservation and creation)	<b>Indirect Impact</b> (creation only)
<b>Impact (acres)</b>	<b>2.4 acres</b>	<b>2.3 acres</b>
<b>Preservation Ratio (2:1)</b>	2.4 x 2 = 4.8 acres	
<b>Direct Impact Creation Ratio (1:1)</b>	2.4 x 1 = 2.4 acres	
<b>Indirect Impact Creation Ratio (3:1)</b>		2.3 x 3 = 6.9 acres

Source: Roseville 2003a, Roseville 2004a, Roseville 2004b, Nagano 2001, R. Kuyper pers. comm..

As illustrated in **Biological Resources Table 2** above, staff proposes preservation of 4.8 acres of habitat (2.4 x 2), and creation of 9.3 acres of habitat (2.4 x 1 + 2.3 x 3).

### **Applicant Proposed Mitigation**

#### **Uplands**

In addition to fairy shrimp habitat compensation, RE indicated that a total of 26.5 acres of annual grasslands would be affected by the proposed project, and proposed to provide compensation for the permanent loss of approximately 5.7 acres of Swainson's hawk and white-tailed kite foraging habitat. RE also proposed to restore approximately 20.8 acres of annual grassland.

### **Staff Proposed Mitigation**

#### **Uplands**

CDFG guidelines suggest mitigation for impacts to nesting Swainson's hawks for projects within 5 miles but greater than 1 mile from an active nest. The guidelines suggest replacement habitat at 0.75 acre of high quality foraging habitat for every 1 acre affected. However, the guidelines also suggest that project specific measures may also be applied. Because of the number of species that could potentially be directly and indirectly affected by the loss, degradation, and fragmentation of uplands on the proposed REP, staff proposes that RE provide 26.5 acres (1:1, the same amount potentially affected) of upland habitat suitable to support:

- Swainson's hawk (federal species of concern, state threatened);
- White-tailed kite (state fully protected);
- Northern harrier (state species of concern);
- Burrowing owl (federal and state species of concern);
- Golden eagle (state fully protected);
- Horned lark (state species of concern);
- Ferruginous hawk (federal and state species of concern).
- Stinkbells (federal species of concern, CNPS list 4);

- Bogg's Lake hedge hyssop (federal species of concern, state endangered, CNPS list 1B);
- Red Bluff dwarf rush (federal species of concern, CNPS list 1B);
- Pincushion navarretia (federal species of concern, CNPS list 1B);
- Legenere (federal species of concern, CNPS list 1B);
- Big-scale balsamroot (federal species of concern, CNPS list 1B);
- Lawrence's goldfinch (federal species of concern);
- Cooper's hawk (state species of concern);
- Bald eagle (state endangered);
- Oak titmouse (federal species of concern); and
- Giant garter snake (federal and state threatened).

## **COMPLIANCE WITH LORS**

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The USACE has not verified RE's wetland delineation, and formal consultation with USFWS has not been initiated. Because the wetland delineation has not been verified, RE cannot submit an application for a 404 Clean Water Act permit to the USACE. Without an application to the USACE, formal section 7 consultation with the USFWS can not begin.

The USFWS requires creation and preservation of habitat for direct impacts, and preservation of habitat for indirect impacts to fairy shrimp habitat. For jurisdictional wetlands, the USACE typically requires creation of wetlands as mitigation for impacts to jurisdictional wetlands. However, until the delineation is verified and 404 permit application is submitted, no analysis of jurisdictional waters can be conducted and the final analysis of vernal pool impacts can not be completed.

Staff is aware that RE has informally consulted with agency staff concerning potential impacts caused by the proposed project. However, staff can not yet determine if the proposed REP would comply with LORS.

## **FACILITY CLOSURE**

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Sometime in the future, the REP will experience either a planned closure, or be unexpectedly (either temporarily or permanently) closed. When facility closure occurs, it must be done in such a way as to protect the environment and public health and safety. To address facility closure, an "on-site contingency plan" will be developed by the project owner, and approved by the Energy Commission Compliance Project Manager (CPM). Facility Closure mitigation measures will also be included in the Biological Resources Mitigation Implementation and Monitoring Plan prepared by the applicant.

The restoration of vernal pool grassland, seasonal wetland and vernal pool/swale habitats on the proposed project footprint will need to be addressed in any discussion of

facility closure. Habitat restoration plans should include such tasks as the removal of all structures and the immediate implementation of habitat restoration measures to establish conditions extant at the time of project application.

Staff does not have any biological resource facility closure recommendations in the event of an unexpected temporary closure of the REP. However, in the event that the Energy Commission CPM decides that the facility is permanently closed, the facility closure measures provided in the on-site contingency plan and Biological Resources Mitigation Implementation and Monitoring Plan would need to be implemented.

## **CONCLUSIONS AND RECOMMENDATIONS**

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RE has not submitted a complete wetland delineation that has been accepted by the U.S. Army Corps of Engineers (USACE). Until the USACE receives and verifies the complete wetland delineation, RE cannot submit a 404 permit application, the USACE cannot begin consultation with the USFWS, and the timeline for the USFWS issuing a Biological Opinion (135 days from request for consultation) could affect the schedule for project licensing. In addition, staff has determined that the amount of mitigation needed to address potential project impacts is greater than the amount proposed by the applicant.

At the PSA workshop, staff will work with the USACE to determine the current status of the wetland delineation, and discuss with the applicant any differences in the amount of mitigation required to address the project's potential impacts to Biological Resources. Staff will present a complete Biological Resources assessment in our Final Staff Assessment.

## **CONDITIONS OF CERTIFICATION**

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Staff proposes the following Conditions of Certification to mitigate potential project impacts to levels less than significant.

### **Designated Biologist Selection**

**BIO-1** The project owner shall submit the resume, including contact information, of the proposed Designated Biologist to the CPM for approval.

**Verification:** The project owner shall submit the specified information at least 60 days prior to the start of any site (or related facilities) mobilization. Site and related facility activities shall not commence until an approved Designated Biologist is available to be on site.

The Designated Biologist must meet the following minimum qualifications:

1. Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field;

2. Three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;
3. At least one year of field experience with biological resources found in or near the project area; and

If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to the CPM at least ten working days prior to the termination or release of the preceding Designated Biologist.

### **Designated Biologist Duties**

**BIO-2** The project owner shall ensure that the Designated Biologist shall perform the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, and closure activities:

1. Advise the project owner's Construction and Operation Managers on the implementation of the biological resources Conditions of Certification;
2. Be available to supervise or conduct mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as wetlands and special status species or their habitat;
3. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
4. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (parking lots) for animals in harms way;
5. Notify the project owner and the CPM of any non-compliance with any biological resources Condition of Certification; and
6. Respond directly to inquiries of the CPM regarding biological resource issues.

**Verification:** The project owner shall ensure that the Designated Biologist maintains written records of the tasks described above, and summaries of these records shall be submitted in the Monthly Compliance Reports.

During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report.

## **Designated Biologist Authority**

**BIO-3** The project owner's Construction/Operation Manager shall act on the advice of the Designated Biologist to ensure conformance with the biological resources Conditions of Certification.

If required by the Designated Biologist, the project owner's Construction/Operation Manager shall halt all site mobilization, ground disturbance, grading, construction, and operation activities in areas specified by the Designated Biologist.

The Designated Biologist shall:

1. Require a halt to all activities in any area when determined that there would be adverse impact to biological resources if the activities continued;
2. Inform the project owner and the Construction/Operation Manager when to resume activities; and
3. Notify the CPM if there is a halt of any activities, and advise the CPM of any corrective actions that have been taken, or will be instituted, as a result of the halt.

**Verification:** The project owner shall ensure that the Designated Biologist notifies the CPM immediately (and no later than the following morning of the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, and operation activities. The project owner shall notify the CPM of the circumstances and actions being taken to resolve the problem.

Whenever corrective action is taken by the project owner, a determination of success or failure will be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

## **Worker Environmental Awareness Program**

**BIO-4** The project owner shall develop and implement a CPM approved Worker Environmental Awareness Program (WEAP) in which each of its employees, as well as employees of contractors and subcontractors who work on the project site or any related facilities during site mobilization, ground disturbance, grading, construction, operation and closure are informed about sensitive biological resources associated with the project.

The WEAP must:

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting written material is made available to all participants;

2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas;
3. Present the reasons for protecting these resources;
4. Present the meaning of various temporary and permanent habitat protection measures;
5. Identify whom to contact if there are further comments and questions about the material discussed in the program; and
6. Include a training acknowledgment form to be signed by each worker indicating that they received training and shall abide by the guidelines.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.

**Verification:** At least 60 days prior to the start of any site (or related facilities) mobilization, the project owner shall provide to the CPM two (2) copies of the WEAP and all supporting written materials prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program.

The project owner shall provide in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date.

The signed training acknowledgement forms shall be kept on file by the project owner for a period of at least six months after the start of commercial operation.

During project operation, signed statements for active project operational personnel shall be kept on file for six months following the termination of an individual's employment.

### **Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP)**

**BIO-5** The project owner shall submit two copies of the proposed BRMIMP to the CPM (for review and approval) and to CDFG and USFWS (for review and comment) and shall implement the measures identified in the approved BRMIMP.

The final BRMIMP shall identify; (typical measures are)

1. All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the project owner;
2. All biological resources Conditions of Certification identified in the Commission's Final Decision;
3. All biological resource mitigation, monitoring and compliance measures required in federal agency terms and conditions, such as those provided in the USFWS Biological Opinion;

4. All biological resources mitigation, monitoring and compliance measures required in other state agency terms and conditions, such as those provided in the CDFG Incidental Take Permit and Streambed Alteration Agreement and Regional Water Quality Control Board permits;
5. All biological resources mitigation, monitoring and compliance measures required in local agency permits, such as site grading and landscaping requirements;
6. All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation and closure;
7. All required mitigation measures for each sensitive biological resource;
8. Required habitat compensation strategy, including provisions for acquisition, enhancement, and management for any temporary and permanent loss of sensitive biological resources;
9. A detailed description of measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;
10. All locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction;
11. Aerial photographs, at an approved scale, of all areas to be disturbed during project construction activities - one set prior to any site or related facilities mobilization disturbance and one set subsequent to completion of project construction. Include planned timing of aerial photography and a description of why times were chosen;
12. Duration for each type of monitoring and a description of monitoring methodologies and frequency;
13. Performance standards to be used to help decide if/when proposed mitigation is or is not successful;
14. All performance standards and remedial measures to be implemented if performance standards are not met;
15. A discussion of biological resources related facility closure measures;
16. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval; and
17. A copy of all biological resources permits obtained.

**Verification:** The project owner shall provide the specified document at least 60 days prior to start of any site (or related facilities) mobilization.



The CPM, in consultation with the CDFG, the USFWS and any other appropriate agencies, will determine the BRMIMP's acceptability within 45 days of receipt.

The project owner shall notify the CPM no less than five working days before implementing any modifications to the approved BRMIMP to obtain CPM approval.

Any changes to the approved BRMIMP must also be approved by the CPM in consultation with CDFG, the USFWS and appropriate agencies to ensure no conflicts exist.

Within thirty (30) days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's site mobilization, ground disturbance, grading, and construction phases, and which mitigation and monitoring items are still outstanding.

### **Closure Plan Measures**

**BIO-6** The project owner shall incorporate into the permanent or unexpected permanent closure plan, and the BRMIMP, measures that address the local biological resources.

The planned permanent or unexpected permanent closure plan shall address the following biological resources related mitigation measures (typical measures are):

1. Removal of transmission conductors when they are no longer used and useful;
2. Removal of all power plant site facilities and related facilities;
3. Measures to restore wildlife habitat to promote the re-establishment of native plant and wildlife species; and
4. Revegetation of the plant site and other disturbed areas utilizing appropriate seed mixture.

**Verification:** At least 12 months prior to commencement of closure activities, the project owner shall address all biological resources related issues associated with facility closure, which is incorporated into the BRMIMP, in a Biological Resources Element. The Biological Resources Element shall be incorporated into the Facility Closure Plan and include a complete discussion of the local biological resources and proposed facility closure mitigation measures.

### **Incidental Take Permit**

**BIO-7** The project owner shall acquire an Incidental Take Permit from the California Department of Fish and Game (CDFG) (per Section 2081(b) of the Fish and Game Code; California Endangered Species Act) and incorporate the terms and conditions into the project's BRMIMP.

**Verification:** At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall submit to the CPM a copy of the final CDFG Incidental Take Permit.

### **Streambed Alteration Agreement**

**BIO-8** The project owner shall acquire a Streambed Alteration Agreement from the CDFG (per Section 1600 of the Fish and Game Code), and incorporate the biological resource related terms and conditions into the project's BRMIMP.

**Verification:** At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall submit to the CPM a copy of the final CDFG Streambed Alteration Agreement.

### **Regional Water Quality Control Board Certification**

**BIO-9** The project owner shall acquire the Regional Water Quality Control Board Section 401 state Clean Water Act certification, and incorporate the biological resource related terms and conditions into the project's BRMIMP.

**Verification:** At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall provide the CPM with a copy of the final Regional Water Quality Control Board's certification.

### **Federal Biological Opinion**

**BIO-10** The project owner shall provide final copies of the Biological Opinion per Section 7 of the federal Endangered Species Act obtained from the U. S. Fish and Wildlife Service. The terms and conditions contained in the Biological Opinion shall be incorporated into the project's BRMIMP.

**Verification:** At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall submit to the CPM a copy of the U. S. Fish and Wildlife Service's Biological Opinion.

### **U. S. Army Corps of Engineers Section 404 Permit**

**BIO-11** The project owner shall provide a final copy of the U.S. Army Corps of Engineers Section 404 of the federal Clean Water Act permit. The biological resources related terms and conditions contained in the permit shall be incorporated into the project's BRMIMP.

**Verification:** At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall submit to the CPM a copy of the U.S. Army Corps of Engineers permit.

### **Construction Mitigation Management to Avoid Harassment or Harm**

**BIO-12** The project owner shall manage their construction site, and related facilities, in a manner to avoid or minimizes impacts to the local biological resources.

Typical measures are:

1. Temporarily fence and provide wildlife escape ramps for construction areas that contain steep walled holes or trenches if outside of an approved, permanent exclusionary fence. The temporary fence shall be hardware cloth or similar materials that are approved by USFWS and CDFG;
2. Make certain all food-related trash is disposed of in closed containers and removed at least once a week. Feeding of wildlife shall be prohibited;
3. Prohibit non-security related firearms or weapons from being brought to the site;
4. Prohibit pets from being brought to the site; and
5. Report all inadvertent deaths of sensitive species to the appropriate project representative. Injured animals shall be reported to CDFG and the project owner shall follow instructions that are provided by CDFG.

**Verification:** All mitigation measures and their implementation methods shall be included in the BRMIMP.

### **Habitat Compensation Vernal Pools**

**BIO-13** As compensation for direct and indirect impacts to vernal pools, and vernal pool fairy shrimp, the project owner shall preserve at least 4.8 acres of vernal pools occupied by vernal pool fairy shrimp. In addition, at least 9.3 acres of vernal pools will be created.

**Verification:** At least 90 days prior to any site, or related facilities mobilization activities, the project owner shall provide to the CPM, for review and approval by staff, CDFG, USACE and USFWS, the location for the preservation and creation of vernal pools. In addition, the project owner shall provide the name of the entity which would protect the habitat in perpetuity, an endowment to manage the habitat in perpetuity, a wetland construction plan/schedule, and an adaptive management plan to be reviewed and approved by staff in consultation with CDFG and USFWS.

### **Habitat Compensation Uplands**

**BIO-14** The project owner shall provide at least 26.5 acres of habitat compensation for direct and indirect impacts to upland habitat suitable for: Swainson's hawk, White-tailed kite, Northern harrier, Burrowing owl, Golden eagle, Horned lark, Ferruginous hawk, Lawrence's goldfinch, Cooper's hawk, Bald eagle, Oak titmouse; and Giant garter snake.

**Verification:** At least 60 days prior to any site, or related facilities mobilization activities, the project owner shall provide to the CPM evidence that habitat compensation has been purchased, the name of the entity which will manage the habitat, and that a

suitable endowment has been provided to manage the habitat in perpetuity. In addition, the project owner shall provide an adaptive management plan to be reviewed and approved by staff in consultation with CDFG and USFWS.

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# **CULTURAL RESOURCES**

Gary Reinoehl

## **INTRODUCTION**

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This cultural resources analysis identifies potential impacts of the proposed Roseville Energy Park (03-AFC-1) (REP) to cultural resources, as defined under state and federal law. The primary concern in the cultural resources analysis for this project is to ensure that all potential impacts are identified and that conditions are set forth that ensure that impacts are mitigated below a level of significance under the California Environmental Quality Act (CEQA) and under the National Environmental Policy Act (NEPA).

Staff provides a cultural overview of the project, as well as analyses of potential impacts from the project using criteria from the CEQA and the National Historic Preservation Act (NHPA). If cultural resources are identified, staff determines whether there may be a project related impact to identified resources and if the resource is eligible for the California Register of Historic Resources (CRHR) or the National Register of Historic Places (NRHP). If the resources are eligible for either register, staff recommends mitigation that attempt to ensure that no significant impacts will occur and that impacts to the cultural resources are reduced to a less than significant level, if possible.

There is always a potential that a project may impact a previously unidentified prehistoric or historic resource in an unanticipated manner. Staff, therefore, recommends procedures in the conditions of certification that mitigate these potential impacts.

## **LAWS, ORDINANCES, REGULATIONS, AND STANDARDS**

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The following laws, ordinances, regulations, and standards (LORS) and policies apply to the protection of cultural resources in California. Projects licensed by the Energy Commission are reviewed to ensure compliance with these LORS.

### **FEDERAL**

- Code of Federal Regulations, 36 CFR Part 61. Federal Guidelines for Historic Preservation Projects: The U.S. Secretary of the Interior has published a set of Standards and Guidelines for Archaeology and Historic Preservation. These are considered to be the appropriate professional methods and techniques for the preservation of archaeological and historic properties. The Secretary's standards and guidelines are used by federal agencies, such as the Forest Service, the Bureau of Land Management, and the National Park Service. The State Historic Preservation Office refers to these standards in its requirements for mitigation of impacts to cultural resources on public lands in California.
- Code of Federal Regulations, 36 CFR Part 800 et seq., the implementing regulations of Section 106 of the National Historic Preservation Act, 16 U.S.C. § 470 requires federal agencies to take into account the effects of their undertakings on historic properties through consultations beginning at the early stages of project planning.



The regulations implementing this act, which were revised in 1997, set forth procedures to be followed for determining eligibility of cultural resources, determining the effect of the undertaking on the historic properties, and how the effect will be taken into account. The eligibility criteria and the process described in these regulations are used by federal agencies. Very similar criteria and procedures are used by the state in identifying cultural resources eligible for listing in the California Register of Historical Resources.

## STATE

- California Code of Regulations, Title 14, section 4852 defines the term "cultural resource" to include buildings, sites, structures, objects, and historic districts.
- Public Resources Code, Section 5000 establishes the California Register of Historical Resources (CRHR), establishes criteria for eligibility to the CRHR, and defines eligible resources. It identifies any unauthorized removal or destruction of historic resources on sites located on public land as a misdemeanor. It also prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and establishes the penalty for possession of such artifacts with intent to sell or vandalize them as a felony. This section defines procedures for the notification of discovery of Native American artifacts or remains, and states that it is the policy of the State that Native American remains and associated grave artifacts shall be repatriated.
- The California Environmental Quality Act (CEQA) (Public Resources Code, section 21000 et seq.; Title 14, California Code of Regulations, section 15000 et seq.) requires analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.
- Public Resources Code section 21083.2 states that the lead agency determines whether a project may have a significant effect on "unique" archaeological resources; if so, an Environmental Impact Report (EIR) shall address these resources. If a potential for damage to unique archaeological resources can be demonstrated, the lead agency may require reasonable steps to preserve the resource in place. Otherwise, mitigation measures shall be required as prescribed in this section. The section discusses excavation as mitigation; limits the applicant's cost of mitigation; sets time frames for excavation; defines "unique and non-unique archaeological resources;" and provides for mitigation of unexpected resources. [The California Energy Commission process is a CEQA equivalent process.]
- Public Resources Code section 21084.1 indicates that a project may have a significant effect on the environment if it causes a substantial adverse change in the significance of a historic resource. The section further defines a "historic resource" and describes what constitutes a "significant" historic resource.
- CEQA Guidelines, Title 14, California Code of Regulations, section 15126.4(b), prescribes the manner of maintenance, repair, stabilization, restoration, conservation, or reconstruction as mitigation of a project's impact on a historical resource; discusses documentation as a mitigation measure; and discusses mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place, or by data recovery

through excavation if avoidance or preservation in place is not feasible. Data recovery must be conducted in accordance with an adopted data recovery plan.

- CEQA Guidelines, section 15064.5 defines the term “historical resources,” explains when a project may have a significant effect on historic resources, describes CEQA’s applicability to archaeological sites, and specifies the relationship between “historical resources” and “unique archaeological resources.” Subsection (f) directs the lead agency to make provisions for historical or unique archeological resources that are accidentally discovered during construction.
- Penal Code, section 622 1/2 states that anyone who willfully damages an object or thing of archaeological or historic interest is guilty of a misdemeanor.
- California Health and Safety Code, section 7050.5 states that if human remains are discovered during construction, the project owner is required to contact the county coroner.
- California Health and Safety Code, section 18961 states that all agencies which enforce and administer approvals, variances, or appeals procedures or decisions affecting the preservation or safety of the historical aspects of historical buildings shall use the alternative provisions of this part and shall consult with the State Historical Building Safety Board to obtain its review prior to undertaking action or making decisions on variances or appeals which affect historical buildings.

## **LOCAL**

### **Placer County**

The County of Placer protects cultural resources by reviewing development applications for compliance with CEQA. More specifically, the Placer County General Plan (1994, Section 5) specifically addresses the identification and protection of cultural resources in a series of policy statements. County Comprehensive General Plan Land Use Standards require the Planning Department to determine whether proposed development will alter or destroy an historical site or an archaeological site, cause a substantial adverse change in the significance of an historical or archaeological resource (cf. California Code of Regulations 15064.5), disturb any human remains, or restrict existing religious or sacred uses.

Placer County’s General Plan identifies one primary objective that is specifically designed for the protection of both Historic and Prehistoric cultural resources. The objective or goal, as it is referred in Section 5.D of the general plan, calls for the identification, protection, and enhancement of the county’s important historical, paleontological, and cultural sites and their environment. It is under this stated goal that the county further defines sixteen separate policy statements that relate to numerous aspects of cultural resource management. The stated policies are the joint responsibility of the Parks Department, Planning Department, and Department of Museums. In addition, Placer Counties Park Classification System, policy (5.A.19.), states that areas, sites, and buildings considered culturally significant are protected, managed and maintained. When appropriate, and as a secondary objective, the county encourages the use of these specially designated areas for recreational events.

## **City of Roseville**

The General Plan of the City of Roseville (2003) establishes the following goals with respect to land use, open space, and conservation issues as these relate to the enhancement, protection and interpretation of cultural resources. The City recognizes that archeological, historical and cultural resources identify Roseville's heritage and provides direction for preservation and management of these sites and buildings. The City maintains a commitment to the preservation of known cultural resources and recognizes the importance of cooperation with outside agencies that include, but are not limited to, the State Office of Historic Preservation and the California Native American Heritage Commission (Open Space and Conservation Element , p. V33-34).

1. A commitment to preserving its small town attributes and cultural heritage, while preserving individual neighborhoods and promoting a prosperous business community (Land Use Element, Community Form, Goal 1b, p. II-30).
2. Emphasize the preservation and enhancement of historically and culturally significant buildings, woodlands and other significant features, as a primary element of Roseville's character (Land Use Element, Community Design, Goal 4. p. II-40).
3. Strengthen and maintain Roseville's unique identity through the protection of its archaeological, historic and cultural resources (Open Space and Conservation Element, Goal 1, p. V-37).

The Open Space and Conservation Element of the Roseville General Plan include the following policies for Archaeological Historic and Cultural Resources (pp. V-37 and V-38):

1. When items of historical, cultural or archaeological significance are discovered within the City, a qualified archaeologist or historian shall be called to evaluate the find and to recommend proper action.
2. When feasible incorporate significant archaeological sites into open space areas.
3. Subject to approval by the appropriate federal, state, and local agencies, artifacts that are discovered and subsequently determined to be "removable" should be offered for dedication to the Maidu Park Native American Interpretive Center.
4. Preserve and enhance Roseville's historic qualities through the implementation of the Downtown, Old Town and Riverside Master Plans.
5. Establish standards for the designation, improvement and protection of buildings, landmarks, and sites of cultural and historic character.
6. Participate in the completion of a countywide inventory of historical sites.
7. Encourage public activities, including the placement of monuments or plaques, that recognize and celebrate historic sites, structures, and events.
8. Explore funding for cultural, archaeological and historic programs and activities.
9. Provide opportunities to public awareness and education through coordination with the Historical Society and local schools.

## **West Roseville Specific Plan**

In addition to the General Plan established for the City of Roseville, there is a specific plan for West Roseville. This document was also prepared for the City of Roseville, and is entitled the West Roseville Specific Plan and Sphere of Influence Amendment, 2003 (WRSP). The WRSP refers to the goals and policies in the Roseville General Plan. The WRSP also recognizes the Fiddymment Ranch Complex as a resource to be preserved as a community facility for use by the City. No specific measures that detail the reuse of the complex are provided.

## **ENVIRONMENTAL SETTING**

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The Roseville Energy Park (REP) project as proposed would be located on a 12-acre site within a 40-acre parcel owned by the City of Roseville, within the city limits and in Placer County. The proposed plant is adjacent to and north of the Pleasant Grove Waste Water Treatment Plant. The project site consists of relatively flat terrain between Phillip Road and Pleasant Grove Creek. The project area is within a 3,162 acre West Roseville Specific Plan (WRSP) development area although it is not part of the WRSP (Roseville 2003a, pp.1-1, 1-7, Figure 8.3-1).

Refer to the **PROJECT DESCRIPTION** section of this Preliminary Staff Assessment for additional information and maps of the project development region and the project area.

## **PREHISTORIC SETTING**

Sites around the state of California are thought to have been occupied before 11,000 years before present ("BP", the BP base date is defined as 1950). Assemblages are small and do not always represent completed tools. Amino-acid dating has been used on some bone from sites that resulted in very early dates. The Amino-acid dating is relatively new and is not fully calibrated so absolute dates are still questionable. Some carbon based materials collected from early sites are believed to have predated the deposits making the radiocarbon dates from the carbon based materials older than the actual deposit. Some of the early sites have been dated from the geological formation that the deposits were found within. In most cases, the early dates from these sites are not fully accepted in the archeological community (Moratto 2004, pp 37-73).

Current archeological knowledge assumes the early inhabitants of California were small groups of hunters and gatherers, relying heavily on the Pleistocene mega fauna. Archeological remains believed to be from this early period were found near Farmington, close to the project area. Possibly archeological materials found near Rancho Murrieta may be related to the Farmington materials (Moratto 2004, pp. 62-64).

There are many more well dated deposits between 10,000 and 6,000 years BP. The larger share of these sites are found in southern California and the Great Basin. Sites from this period in the inland areas tend to concentrate around lake shores and marshes, while coastal sites tend to concentrate along old stream channels and estuaries. Animals that live on land as well as in the water were hunted for food. The abundant food resources in the lacustrine (lake edge), marshland, and estuarine (tidal area of a river) areas were sufficient to support larger populations than during the earlier

period. Lithic (stone) technology became more sophisticated and the assemblages exhibited a wider array of specialized tools. Archeologists assume that these peoples were still nomadic in nature, probably moving in seasonal rounds (Moratto 2004, pp.76-113).

During the last 6,000 years, the populations in California developed more local variation. Large villages became more common. Archeologists have divided this time period into Early, Middle and Late Horizons. Different archeologists studying the Sacramento Valley area have broken the horizons at somewhat different times or have referred to the divisions as Cultures, Patterns or Aspects. Better preservation of archeological materials from the more recent times has allowed greater understanding of the people and better interpretation of the cultural adaptations (Moratto 2004, pp. 168-216).

This period is characterized by greater reliance on acorns as a staple. Large villages near creeks and rivers are common. Trade is more developed where imported shell beads and obsidian are more frequently found in deposits. Within a few miles of the project area, large villages such as the site at Maidu Regional Park are not uncommon. Some villages are along smaller drainages such as Pleasant Grove Creek.

## **ETHNOGRAPHIC BACKGROUND**

The project site is within the area of the Nisenan or sometimes referred to as the Southern Maidu. The Nisenan are part of the Penutian linguistic family. They occupied the area around the drainages of the Yuba, Bear and American Rivers, with the western boundary at the Sacramento River and the eastern boundary at the crest of the Sierra Nevada (Wilson and Towne 1978, pp. 387-397).

There were several political divisions within the Nisenan territory. One center was at the mouth of the American River, one at the mouth of the Bear, one at the mouth of the Yuba, one near Placerville, and one in the ridges between the Bear and the middle fork American River (Wilson and Towne 1978, pp. 387-397).

The Nisenan area provided abundant food resources. Food gathering usually followed a seasonal round, i.e. following the foods as they ripened. Hunting and fishing provided a year round diet base, but was concentrated in the late summer and early fall. Trade with valley groups and the Washo provided a wider variety of diet and materials such as shell beads, magnetite, steatite and obsidian (Wilson and Towne 1978, pp. 387-397).

Villages were typically a group of dome or conical houses varying from three to seven houses up to forty to fifty houses. Dance houses were at major villages. Spanish explorers crossed Nisenan territory in the early 1800s. Trappers from the Hudson Bay Company were trapping and establishing camps within Nisenan territory. Village populations were greatly diminished by the epidemic of 1833. The discovery of gold in Coloma within Nisenan territory by Euro-Americans started a massive migration of new people into Nisenan country (Wilson and Towne 1978, pp. 387-397).

## **HISTORIC SETTING**

Euro-Americans began entering into this part of California in the late 1700s to early 1800s, first as explorers and then as trappers. The biggest change to this area

occurred when floods of new immigrants arrived in the years following the discovery of gold in the middle 1800s. The area became overrun and to a great extent overturned by the gold seekers in the area previously occupied by the Nisenan (Wilson and Towne 1978, pp. 387-397).

The gold rush only lasted a few years in this area and ranching quickly became the dominant business. During the mid 1860s and 1870s sheep ranching was a major enterprise and ranchers owned large tracks of land. The completion of the transcontinental railroad in 1864 provided transport for the ranch products to the markets to the east. Roseville became a major shipping and trading center, becoming the largest freight yards west of the Mississippi by the 1920s (G&B 2003a).

The Fiddymment Ranch was one of the large agricultural/ranching enterprises in the area. This ranch operated for over 125 years, from the 1870s until today. The ranch produced sheep, cattle, turkeys and other agricultural products. Many of the ranch buildings still remain on the property (G&B 2003a).

## **RESOURCES INVENTORY**

### **Literature and Records Search**

The City of Roseville conducted a record search at the North Central Information Center of the California Historical Resources Information System (CHRIS) at California State University, Sacramento on July 31, 2003. The search included an area 0.5 mile around the plant and the linear facilities. Seventeen cultural resource surveys had been conducted within this area since 1979. Eight of the surveys are current (conducted within the last five years). Nineteen resources have been recorded as a result of the surveys. The applicant also consulted lists of historic resources maintained by local municipalities (Roseville 2003a, p. 8.3-9, Table 8.3-1 and Table 8.3-2). Local historical and archeological societies were contacted regarding their knowledge of local resources (CH2MHill 2004a, p. CR-5)). Recorded resources are listed in Table 1. The prior surveys covered the plant site and nearly all of the natural gas pipeline.

**Table 1: Previously recorded cultural resources within record search area and project component.**

<b>Primary Number or Trinomial</b>	<b>Report Citation</b>	<b>Site type</b>	<b>Project Component</b>
P-31-0263 CA-PLA-137	URS Corp. & Mott, J. B.	Historic/Prehistoric	Gas Pipeline
P-31-0199 CA-PLA-073	Mott, J. B.	Prehistoric	Gas Pipeline
P-31-0855 CA-PLA-729	Peak & Assoc.	Prehistoric	Gas Pipeline
P-31-0856 CA-PLA 730	Peak & Assoc.	Ruin, Pleasant Grove School	Gas Pipeline
P-31-1219	PAR 2001	Road	Gas Pipeline
P-31-1222 CA-PLA-969	PAR 2001	Ruins	Gas Pipeline
P-31-1224	PAR 2001	Structure	Gas Pipeline
P-31-1225	PAR 2001	Fiddymment Ranch Barn	Gas Pipeline
P-31-1227	PAR 2001	Turkey Brooding Shed	Gas Pipeline
P-31-1228	PAR 2001	Turkey Farm Complex	Gas Pipeline
P-31-1229	PAR 2001	Pump house	Gas Pipeline
P-31-1590	Dames & Moore	Grave	Gas Pipeline

### **Native American Contacts**

As part of the background research for the project, the applicant contacted the Native American Heritage Commission (NAHC) via letter dated October 1, 2003, requesting information on sacred lands and ethnographically important sites and other properties that might be located in or near the project site or its components, as well as a list of Native American contacts with potential knowledge of the area. The NAHC responded on October 10, 2002 that they had no sacred sites listed in their data base and provided a list of five Native American contacts. The applicant contacted all of the Native American contacts via letter dated October 16, 2003.

The applicant received one response from the United Auburn Indian Community requesting a copy of a field survey and record search be prepared by a qualified archeologist. After reviewing the report, they would determine if cultural resources of importance to them would be impacted.

Staff also requested a list of interested Native Americans from the NAHC. In November of 2003, letters were sent to all of the interested Native Americans. No responses have been received. Additional contacts will be made to determine if there are cultural resources in the project area that could be impacted.

## **Field Surveys**

### **Natural Gas Pipeline**

Portions of the natural gas pipeline alternatives along the road shoulder of Baseline Road on the south side between PG&E Line 123 (500 feet east of Country Club Lane) and Fiddymment Road, an area on the east side of Fiddymment Road south of the power lines to Pleasant Grove Boulevard and along the north side of Pleasant Grove Boulevard to Sun City Boulevard. No new resources were discovered as a result of the survey.

## **CATEGORIZATION OF IDENTIFIED CULTURAL RESOURCES**

Various laws apply to the treatment of cultural resources. These laws require the Energy Commission to categorize cultural resources by determining whether they meet sets of specified criteria. These categories then in turn influence the analysis of potential impacts to the cultural resources and the methods and consultation required to mitigate any such impacts. Federal laws apply when a federal agency takes an action.

Under federal law, only historical or prehistoric sites, objects, or features, or architectural resources that are assessed as “significant” in accordance with federal guidelines need to be considered in analyzing potential impacts. The significance of historical and prehistoric cultural resources is based on the criteria for eligibility for nomination to the NRHP as defined in Title 36, Code of Federal Regulations, section 60.4. If such resources are determined to be significant, and therefore eligible for listing in the NRHP, they are afforded certain treatment under the National Historic Preservation Act. If the resources are determined to be significant, and therefore eligible for the CRHR, then mitigation measures are implemented under CEQA to reduce the impact to less than significant if possible. Federal agencies are responsible for meeting the requirements of NHPA and the Energy Commission is responsible for meeting the requirements of CEQA.

The National Register criteria state that “eligible historic properties” are: districts, sites, building, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that:

- a) are associated with events that have made a significant contribution to the broad patterns of our history; or
- b) that are associated with the lives of persons significant in our past; or
- c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- d) that have yielded, or may be likely to yield, information important to history or prehistory.

California has adopted a similar set of criteria for assessing resources for the California Register of Historical Resources. The CRHR criteria are noted as 1, 2, 3, and 4 while the NRHP criteria are noted as a, b, c, and d.



Under federal law, cultural resources determined not to be significant and that do not meet the eligibility criteria for the NRHP are subject to recording and documentation only and are afforded no further treatment. However, occasionally certain resources, although they may not be assessed as “significant,” may nonetheless be of local or regional importance such that mitigation may be warranted regardless of their assessed significance. Energy Commission staff and involved federal agencies evaluate the survey reports and site records for any known resources located within or adjacent to the project’s Area of Potential Effects (APE) to determine whether they meet the eligibility criteria.

The record and literature search and the pedestrian surveys of the proposed project were conducted to identify the presence of any cultural resources. Where cultural resources were identified, additional evaluation was conducted to determine whether the resources are already listed on, or are potentially eligible for listing on either the NRHP [36 CFR 800] or the CRHR. The determination of eligibility is made in compliance with the applicable provisions of the NHPA.

CEQA Guidelines explicitly require the lead agency (in this case, the Energy Commission) to make a determination of whether a proposed project will affect “historical resources” (Cal. Code Regs., tit. 14, §15064.5). The guidelines provide a definition for historical resources and set forth a listing of criteria for making this determination (Cal. Code Regs., tit. 14 § 15064.5). These criteria are the eligibility criteria for the CRHR and are essentially the same as the eligibility criteria for the NRHP. In addition, as with the NRHP, historical resources must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. Resources eligible for the CRHR may have less integrity than the resources eligible for the NRHP. If the criteria are met and the resource is determined eligible for the CRHR, the Energy Commission must evaluate whether the project will cause a “substantial adverse change in the significance of the historical resource,” which the regulation defines as a significant effect on the environment Cal. Code Regs., tit. 14 § 15064.5.

CEQA also contains a section addressing “unique” archeological resources and provides a definition of such resources (PRC, § 21083.2). This section establishes limitations on analysis and prohibits imposition of mitigation measures for impacts to archeological resources that are not unique. However, the CEQA Guidelines state that the limitations in this section do not apply when an archeological resource has already met the definition of an historical resource (Cal. Code Regs., tit. 14 § 15064.5).

Native American consultation for the proposed project has not been completed. The consultation is to identify sensitive resources that could be impacted by the project. The results of the consultation will be contained in the Final Staff Assessment.

## **ANALYSIS AND IMPACTS**

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Since project development and construction usually entail surface and subsurface disturbance, the proposed REP has the potential to adversely affect both known and unknown cultural resources. Staff has analyzed the potential direct, indirect, and

cumulative impacts from the proposed project. Direct impacts are those which may result from the immediate disturbance of resources, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation or demolition. Indirect impacts are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or vandalism due to improved accessibility. Cumulative impacts to cultural resources may occur if increasing amounts of land are cleared and disturbed for the development of multiple projects in the same vicinity as the proposed project.

The potential for the project to cause impacts to cultural resources is related to the likelihood that such resources are present and whether they are actually encountered during project development and construction activities. Although the existence of known cultural resources increases the potential for additional resources, the absence of known resources does not necessarily mean that unknown resources will not be encountered and that impacts will therefore not occur.

Resources have only been identified in the vicinity of the linear facilities associated with the project. The construction of the natural gas pipeline requires a trench from between three feet wide to 12 feet wide with another ten to fifty feet required for equipment access. Bore or drilling pits will be necessary at entry and exit areas where the pipeline goes under existing roads or under Kaseberg Creek. Table 2 indicates the resource proximity to project components and the determination of eligibility made by the City of Roseville in the West Roseville Specific Plan. All of the resources that have been determined to be ineligible for meeting the requirements listing on the California Register of Historic Places will no longer be considered in this analysis.

CA-PLA-263 is near to the alignment for the natural gas pipeline. The site was originally recorded in 1961. The record noted that cultural materials were unearthed during agricultural plowing. URS Corporation updated the record in 2001 indicating that heavy grass cover obscured native soils. Surface vegetation was scraped back in several locations revealing dark soils, but no cultural materials on the surface. The site was not tested or evaluated by URS Corporation or the WRSP.

CA-PLA-073 and CA-PLA-729 are both over 500 feet from the linear components. The project description does not describe any activities that would occur this far from the components. The sites will not be considered in this analysis because of the distance from the components.

CA-PLA-730 is about 100 feet east of Fiddymont Road in a developed community. Construction of the pipeline alternative in this area is planned for the west side of Fiddymont Road and no impacts from the project are expected to occur in this developed community. The project description does not indicate any activities that would occur in this area. The site will not be considered in this analysis because of its location in relation to Fiddymont Road and the proposed linear component.

**Table 2: Proximity of resource to project components and eligibility from WRSP.**

Primary Number or Trinomial	Distance from project component	CRHR Eligibility WRSP
P-31-0263./ CA-PLA-263	~200 feet from natural gas pipeline	NA
P-31-0199 / CA-PLA-073	~850 feet from natural gas pipeline	NA
P-31-0855 / CA-PLA-729	~1300 feet from natural gas pipeline	NA
P-31-0856 / CA-PLA 730	~200 feet from natural gas pipeline	NA
P-31-1219	~1320 feet from natural gas pipeline	Ineligible
P-31-1222 / CA-PLA-969	~1200 feet from natural gas pipeline	Ineligible
P-31-1224	~1000 feet from natural gas pipeline	Ineligible
P-31-1225	~1000 feet from natural gas pipeline	Ineligible
P-31-1227	~500 feet from natural gas pipeline	Ineligible
P-31-1228	In alignment of natural gas pipeline	Ineligible
P-31-1229	~1000 feet from natural gas pipeline	Ineligible
P-31-1590	~200 feet from natural gas pipeline	Ineligible
P-31-1217	~1000 feet from gas natural pipeline	Ineligible
P-31-1223 / CA-PLA-970	~1000 feet from natural gas pipeline	Eligible
P-31-1215	~5000 feet from project site	Ineligible
P-31-1216	~1000 feet from project site	Ineligible
P-31-1218	~5000 feet from project site	Ineligible
P-31-1220 / CA-PLA-967	~2000 feet from natural gas pipeline	Ineligible
P-31-1221 / CA-PLA-968	~5000 feet from natural gas pipeline	Ineligible

NA = not assessed

## PROJECT SPECIFIC IMPACTS

Only impacts to eligible cultural resources sites can be potentially significant. The Fiddymment Ranch Main Complex (P-31-1223 / CA-PLA-970) was determined to “meet California and National Register Criterion 1, 3 and 4” by the City of Roseville in the WRSP. Although construction impacts are not planned for the area where this resource is located, the plant and the visible water vapor plumes from the cooling tower will change the setting, feeling and association of this historical resource. Plumes having a range of length approximately 2,000 to 2,400 feet will be visible one percent of the “clear” hours. Plumes having a range of length approximately 269 to 328 feet will be visible 10 percent of the “clear” hours. Please refer to the **Visual Resources** section for details on the modeling for the “clear” hours cooling tower plume dimensions.

The WRSP states that the Fiddymment Ranch Main Complex would be preserved as a community facility for future use by the City of Roseville. Preservation would be assured through three mitigation measures: MM 4.8-4(a)-retain Fiddymment Ranch Main Complex in current location , or (b) retain portions of the Fiddymment Ranch Main Complex; MM 4.8-5-record historically significant resources; and MM 4.8-6-rehabilitate and reuse historically significant properties. However, further discussion indicates that portions or all of the Fiddymment Ranch Main Complex may be moved or demolished, stating, “it is not certain which buildings specifically will remain and which buildings may be removed.” The plan suggests that if buildings are removed they would be barns or outbuildings, resulting in significant and unavoidable impact. Certainly, the removal of

any of the barns or outbuildings would result in further loss of integrity for design, materials and workmanship. Even recordation of these resources would not fully recover the values of the Fiddymment Ranch Main Complex under criterion 1.

The WRSP allows development of lands around the Fiddymment Ranch Main Complex. The first phase of development includes much of the land around the Fiddymment Ranch Main Complex. The development around the Fiddymment Ranch Main Complex will alter the setting, feeling and association of this historical resource to a significant degree. The ranch will no longer be associated with the open undeveloped rural ranch property, isolating it into an urban setting with other buildings, streets and parking areas surrounding the structures. The buildings would still retain a high degree of integrity of location, design, materials, and workmanship. Modern housing exists about 0.75 mile to the east and a newly completed, but not yet operational, sewage treatment plant is less than 375 feet to the west. The power plant is proposed to be about 0.25 mile to the northwest of the Fiddymment Ranch Main Complex and is a relatively small facility compared to the housing, the waste water treatment plant and the first phase of development allowed by the WRSP. The plumes will be the most visible manifestation of the power plant approximately 25 percent of the "clear" hours. The additional diminishment of the setting, feeling, and association caused by the construction of REP and the associated plumes would not be sufficient to materially impair the Fiddymment Ranch Main Complex.

Impacts could occur to CA-PLA-263 as a result of the proposed project. Clarification of the location of the site is required to determine if a condition of certification needs to be prepared to detail mitigation measures for this site. If during clearing, testing or construction, CA-PLA-263 is discovered to be in the project area, then the site would have to be evaluated for the CRHR. If CA-PLA-263 is eligible for the CRHR, then data recovery or other mitigation measures would need to be conducted before construction could continue within the boundary of the site.

Consultation with Native Americans to identify and evaluate resources is not yet complete. Information regarding any resources that could be impacted will be provided in the Final Staff Assessment. Staff is continuing to contact Native American groups and individuals to identify resources that could be impacted by the project. If there is a resource that qualifies as a Native American sacred site that would be impacted by the project, then mitigation measures would be developed to reduce the impacts to a less than significant level, if possible.

## **CUMULATIVE IMPACTS**

The proposed project would have an incremental diminishment of the setting, feeling, and association of the Fiddymment Ranch Main Complex, but its contribution to the cumulative impact on the Fiddymment Ranch Main Complex would not, by itself, result in a cumulatively considerable, or significant impact. However, the WRSP states that even with mitigation it will result in a significant and unavoidable impact. Consultation with Native American groups has not been completed. If cultural resources are identified, mitigation may need to be developed. Energy Commission staff will provide a complete evaluation of the project's potential cumulative impacts in the Final Staff Assessment.

## **FACILITY CLOSURE**

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At the time of planned closure, all then-applicable LORS will be identified and the closure plan required by the Energy Commission will address compliance with these LORS. Generally, if no additional ground disturbance occurs during closure activities and all conditions of certification have been met, no impacts to cultural resources would be expected. However, actual potential impacts are likely to depend upon the final location of project structures in relation to existing resources, and upon the procedures used for the removal of project structures. Since the spatial relationship between the closure and removal of project structures and sensitive resources cannot be determined at this time, no conclusion can be drawn at this time with respect to the impact of facility closure on cultural resources. The closure plan, when created, will address impacts to cultural resources.

A temporary closure should have no impacts on cultural resources as long as no additional lands are needed for the closure. A contingency plan for temporary cessation of operation would be implemented that would ensure compliance with all applicable LORS.

If a site were abandoned, impact to cultural resources would be unlikely because there would be no immediate soil disturbances. Over time, depending on the need to disturb the ground to accomplish project closure and facility removal, some disturbance of known and/or previously unknown cultural resources might result.

## **COMPLIANCE WITH APPLICABLE LORS**

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Placer County and the City of Roseville have policies and goals for the protection of cultural resources, but have no specific procedures for implementation of CEQA that differ from procedures used by the Energy Commission. The power plant site is owned by the City of Roseville and the linear facilities are within the area encompassed by the WRSP. The WRSP requirements are consistent with CEQA and the proposed conditions of certification. Implementation of the mitigation measures recommended in the conditions of certification will ensure compliance with state and local LORS.

## **MITIGATION**

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For cultural resources, the preferred method of mitigation is for project construction to avoid areas where cultural resources are known to exist, wherever possible. Often however, avoidance cannot be achieved and other measures such as surface collection, subsurface testing, and data recovery must be implemented for archaeological resources and documentation must be implemented for historical structures. Mitigation measures are developed to reduce the potential for adverse project impacts on cultural resources to a less than significant level.

## **APPLICANT'S PROPOSED MITIGATION**

REP recommends that a Cultural Resources Specialist (CRS) and Archeological Monitor (AM) would be retained. The CRS would conduct a worker education session for construction supervisory personnel covering the importance and legal protection of

significant archeological resources. The monitor would observe mechanical exaction in high sensitivity areas such as areas on or near stream terraces. If archeological resources are identified during construction the AM, CRS and construction superintendent will be notified and construction in that area will be halted, if necessary. The CRS will delineate the area where construction is halted. Construction will remain halted until the CRS, in consultation with the Energy Commission staff, inspect and evaluate the discovery. If human remains are found, project officials will follow state law. The CRS and AM will record all discoveries on Department of Parks and Recreation Form 523.

## **STAFF'S PROPOSED MITIGATION MEASURES**

Archeological site CA-PLA-263 could be impacted by the project and has not been evaluated. Additional conditions may be necessary in the Final Staff Assessment to determine if the site would be impacted by the project. Staff's proposed conditions of certification are consistent with applicant's proposed mitigation measures. The applicant's measures are incorporated into staff's proposed conditions of certification **CUL-1** through **CUL-8** presented below.

Staff's proposed conditions require implementation of the following measures:

**CUL-1** requires that a qualified cultural resources specialist (CRS) manage cultural resources activities for the project. It also ensures that additional qualified specialists or cultural resources monitors would be retained as needed for the project. To ensure that cultural resources are adequately protected, **CUL-1** requires that the CRS have three years of experience in California. In addition to other relevant types of experience, the condition requires that the CRS have some background in data recovery.

**CUL-2** requires the project owner to provide the CRS with maps and construction schedule information necessary to schedule monitors and cultural resources activity at the project site.

**CUL-3** requires that a Cultural Resources Monitoring and Mitigation Plan (CRMMP) is developed that details all required activities that must be completed to reduce impacts to a level that is less than significant. The CRMMP defines the roles and responsibilities of cultural resources personnel and provides timelines for the completion of the required mitigation. The CRS would also obtain Native American monitors to observe work in areas where Native American artifacts are found. The CRMMP requires a discussion of curation specifications, materials to be transferred to a curation facility, and the responsibility of the owner to pay all curation fees.

**CUL-4** requires that the project owner provide a Cultural Resources Report (CRR) in Archaeological Resource Management Report (ARMR) format. This report would provide information on all field activities and the findings. The CRR would include all Department of Parks and Recreation (DPR) 523 forms and cultural resource reports not previously provided to the California Historic Resource Information System (CHRIS). Copies of the CRR would be provided to the State Historic Preservation Officer (SHPO), the CHRIS and the curating institution (if archaeological materials were collected).

**CUL-5** provides for worker environmental training. The training serves to instruct workers that halting construction is necessary if a potential cultural resource is discovered. It also provides them with instruction regarding applicable laws, penalties and reporting requirements in the event something is discovered. Workers are also instructed that the CRS and other cultural resources personnel have the authority to halt construction in the event of a discovery.

**CUL-6** requires monitoring, including by Native American monitors where appropriate, of the ground disturbance for the project, linear facilities, and ancillary areas and a process for reducing monitoring to a level below full time. It also requires monitoring logs and weekly summaries of the monitoring activities. All non-compliance issues have to be reported to the CPM, and a reporting process is required. **Cul-6** ensures that unanticipated impacts to cultural resources are identified.

**CUL-7** requires notification of staff within 24 hours of a cultural resources find. Timely notification enables staff participation in determinations of significance and the selection of appropriate mitigation to lessen impacts on cultural resources to a level that is less than significant.

The CRS, alternate CRS and the CRMs have the authority to halt work so that the Applicant has flexibility in construction scheduling. The CRS does not have to be at all active areas of construction at the same time.

## CONCLUSIONS AND RECOMMENDATION

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The following is needed to complete the Cultural Resources analysis, and to determine impacts and any necessary mitigation measures:

1. Staff is continuing to contact interested Native American groups and individuals regarding resources that could be impacted by the project. If there is a resource that qualifies as a Native American sacred site, then mitigation measures would need to be developed to reduce the impacts to less than significant, if possible. This will be completed prior to that Final Staff Assessment.
2. Ground disturbing activities could impact CA-PLA-263. An additional cultural resource survey is needed to determine if CA-PLA-263 is within the impact area. Staff has informally requested that the applicant examine this area again. If CA-PLA-263 could be impacted by project activities, then the resources would have to be evaluated to determine if it meets the eligibility requirements for the CRHR. If a resource meets the eligibility requirements, then mitigation measures would be developed to reduce the impacts to less than significant.

## PROPOSED CONDITIONS OF CERTIFICATION

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**CUL-1** Prior to the start of ground disturbance, the project owner shall obtain the services of a **Cultural Resources Specialist (CRS)**, and one or more alternates, if alternates are needed, to manage all monitoring, mitigation and curation activities. The CRS may elect to obtain the services of **Cultural Resource Monitors (CRMs)** and other technical specialists, if needed, to

assist in monitoring, mitigation and curation activities. The project owner shall ensure that the CRS evaluates any cultural resources that are newly discovered or that may be affected in an unanticipated manner for eligibility to the California Register of Historic Resources (CRHR). No ground disturbance shall occur prior to CPM approval of the CRS, unless specifically approved by the CPM. The CRS will be accepted on a provisional basis until the CRMMP required in Cul-3 is approved. Approval of a CRS may be denied or revoked for non compliance on this or other projects.

### **CULTURAL RESOURCES SPECIALIST**

The resume for the CRS and alternate(s) shall include information demonstrating that the minimum qualifications specified in the U.S. Secretary of Interior Guidelines, as published in the Code of Federal Regulations, 36 CFR Part 61 are met. In addition, the CRS shall have the following qualifications:

1. The technical specialty of the CRS shall be appropriate to the needs of the project and shall include a background in anthropology, archaeology, history, architectural history or a related field; and
2. At least three years of archaeological or historic, as appropriate, resource mitigation and field experience in California.

The resume of the CRS shall include the names and telephone numbers of contacts familiar with the work of the CRS on referenced projects, and shall demonstrate that the CRS has the appropriate education and experience to accomplish the cultural resource tasks that must be addressed during ground disturbance, grading, construction and operation. In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the CPM that the proposed CRS or alternate has the appropriate training and background to effectively implement the conditions of certification.

### **CULTURAL RESOURCES MONITOR**

CRMs shall have the following qualifications:

1. a BS or BA degree in anthropology, archaeology, historic archaeology or a related field and one year experience monitoring in California; or
2. an AS or AA degree in anthropology, archaeology, historic archaeology or a related field and four years experience monitoring in California; or
3. enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historic archaeology or a related field and two years of monitoring experience in California.

### **CULTURAL RESOURCES TECHNICAL SPECIALISTS**

The resume(s) of any additional technical specialists, e.g. historic archeologist, historian, architectural historian, physical anthropologist shall be submitted to the CPM for approval.

**Verification:** The project owner shall submit the resume for the CRS, and alternate(s) if desired, to the CPM for review and approval at least 45 days prior to the start of ground disturbance.



At least 10 days prior to a termination or release of the CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval.

At least 20 days prior to ground disturbance, the CRS shall provide a letter naming anticipated CRMs for the project and stating that the identified CRMs meet the minimum qualifications for cultural resource monitoring required by this condition. If additional CRMs are obtained during the project, the CRS shall provide additional letters to the CPM identifying the CRMs and attesting to the qualifications of the CRM, at least five days prior to the CRM beginning on-site duties. At least 10 days prior to beginning tasks, the resume(s) of any additional technical specialists shall be provided to the CPM for review and approval.

At least 10 days prior to the start of ground disturbance, the project owner shall confirm in writing to the CPM that the approved CRS will be available for on-site work and is prepared to implement the cultural resources conditions of certification.

**CUL-2** Prior to the start of ground disturbance, the project owner shall provide the CRS and the CPM with maps and drawings showing the footprint of the power plant and all linear facilities. Maps shall include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2000 or 1" = 200') for plotting individual artifacts. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM. The CPM shall review submittals and in consultation with the CRS approve those that are appropriate for use in cultural resources planning activities.

If construction of the project would proceed in phases, maps and drawings not previously provided shall be submitted prior to the start of each phase. Written notification identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

At a minimum, the CRS shall consult weekly with the project construction manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases. No ground disturbance shall occur prior to CPM approval of maps and drawings, unless specifically approved by the CPM.

**Verification:** (1)The project owner shall submit the subject maps and drawings at least 40 days prior to the start of ground disturbance. The CPM will review submittals in consultation with the CRS and approve maps and drawings suitable for cultural resources planning activities.

(2)If there are changes to any project related footprint, revised maps and drawings shall be provided at least 15 days prior to start of ground disturbance for those changes.

(3)If project construction is phased owner shall submit the subject maps and drawings, if not previously provided, 15 days prior to each phase.

(3) A current schedule of anticipated project activity shall be provided to the CRS on a weekly basis during ground disturbance and also provided in each Monthly Compliance Report (MCR).

(4) The project owner shall provide written notice of any changes to scheduling of construction phases within five days of identifying the changes.

**CUL- 3** Prior to the start of ground disturbance, the project owner shall submit the Cultural Resources Monitoring and Mitigation Plan (CRMMP), as prepared by the CRS, to the CPM for approval. The CRMMP shall identify general and specific measures to minimize potential impacts to sensitive cultural resources. Copies of the CRMMP shall reside with the CRS, alternate CRS, each monitor, and the project owner's on-site manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless specifically approved by the CPM.

The CRMMP shall include, but not be limited to, the following elements and measures.

1. A proposed research design that includes a discussion of research questions and testable hypotheses applicable to the project area. A refined research design will be prepared for any resource where data recovery is required. A programmatic treatment plan may be included in the CRMMP for limited resources types.
2. The following statement shall be added to the Introduction: Any discussion, summary, or paraphrasing of the conditions in this CRMMP is intended as general guidance and as an aid to the user in understanding the conditions and their implementation. If there appears to be a discrepancy between the conditions and the way in which they have been summarized, described, or interpreted in the CRMMP, the conditions, as written in the Final Decision, supercede any interpretation of the conditions in the CRMMP. (The Cultural Resources Conditions of Certification are attached as an appendix to this CRMMP.)
3. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during ground disturbance, construction, and post-construction analysis phases of the project.
4. Identification of the person(s) expected to perform each of the tasks, their responsibilities; and the reporting relationships between project construction management and the mitigation and monitoring team.
5. A discussion of the inclusion of Native American observers or monitors, the procedures to be used to select them, and their role and responsibilities.
6. A discussion of all avoidance measures (such as flagging or fencing), to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during construction and/or operation, and identification of areas where these measures are to be implemented. The discussion

shall address how these measures would be implemented prior to the start of construction and how long they would be needed to protect the resources from project-related effects.

7. A discussion of the requirement that all cultural resources encountered shall be recorded on a DPR form 523 and mapped (may include photos). In addition, all archaeological materials collected as a result of the archaeological investigations (survey, testing, data recovery) shall be curated in accordance with The State Historical Resources Commission's "Guidelines for the Curation of Archaeological Collections," into a retrievable storage collection in a public repository or museum. The public repository or museum must meet the standards and requirements for the curation of cultural resources set forth at Title 36 of the Federal Code of Regulations, Part 79.
8. A discussion of any requirements, specifications, or funding needed for curation of the materials to be delivered for curation and how requirements, specifications and funding shall be met. If archaeological materials are to be curated, the name and phone number of the contact person at the institution. This shall include information indicating that the project owner will pay all curation fees and state that any agreements concerning curation will be retained and available for audit for the life of the project.
9. A discussion of the availability and the designated specialist's access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resource materials encountered during construction.
10. A discussion of the proposed Cultural Resource Report (CRR) which shall be prepared according to Archaeological Resource Management Report (ARMR) Guidelines.

**Verification:** The project owner shall submit the subject CRMMP at least 45 days prior to the start of ground disturbance. Per ARMR Guidelines the author's name shall appear on the title page of the CRMMP.

If the CRMMP has not been found satisfactory for approval 15 days prior to the project owner's proposed ground disturbance start date, the CPM shall notify the project owner that the provisionally approved CRS has been rejected. Ground disturbance activities may not commence until the CRMMP is approved, unless specifically approved by the CPM.

A letter shall be provided to the CPM indicating that the project owner would pay curation fees for any materials collected as a result of the archaeological investigations (survey, testing, data recovery).

**CUL-4** The project owner shall submit the Cultural Resources Report (CRR) to the CPM for approval. The CRR shall be written by the CRS and shall be provided in the ARMR format. The CRR shall report on all field activities including dates, times and locations, findings, samplings and analysis. All survey reports, Department of Parks and Recreation (DPR) 523 forms and

additional research reports not previously submitted to the California Historic Resource Information System (CHRIS) and the State Historic Preservation Officer (SHPO) shall be included as an appendix to the CRR. If the ARMR reports have previously been sent to the CHRIS, then receipt letters from the CHRIS shall be included in an appendix.

**Verification:** The project owner shall submit the subject CRR within 90 days after completion of ground disturbance (including landscaping). Within 10 days after CPM approval, the project owner shall provide documentation to the CPM that copies of the CRR have been provided to the SHPO, the CHRIS and the curating institution (if archaeological materials were collected).

**CUL-5** Prior to and for the duration of ground disturbance, the project owner shall provide Worker Environmental Awareness Program (WEAP) training to all new workers within their first week of employment. The training shall be conducted by the CRS and may be presented in the form of a video. The CRS shall be available (telephone or in person) to answer questions posed by employees. The CRS shall provide a draft of the training text and graphics to the CPM for review and approval. The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. Samples or visuals of artifacts that might be found in the project vicinity;
3. Information that the CRS, alternate CRS, and CRMs have the authority to halt construction to the degree necessary, as determined by the CRS, in the event of a discovery or unanticipated impact to a cultural resource;
4. Instruction that employees are to halt work on their own in the vicinity of a potential cultural resources discovery, and shall contact their supervisor and the CRS or CRM; and that redirection of work would be determined by the construction supervisor and the CRS;
5. An informational brochure that identifies reporting procedures in the event of a discovery;
6. An acknowledgement form signed by each worker indicating that they have received the training; and
7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

No ground disturbance shall occur prior to implementation of the WEAP program, unless specifically approved by the CPM.

**Verification:** Thirty days prior to the beginning of site mobilization, the project owner shall provide the CRS draft text and graphics for the training program. The project owner shall provide in the Monthly Compliance Report the WEAP Certification of Completion form of persons who have completed the training in the prior month and a running total of all persons who have completed training to date.

**CUL-6** The project owner shall ensure that the CRS, alternate CRS, or CRMs shall monitor ground disturbance full time in the vicinity of the project site, linear and ground disturbance at laydown areas or other ancillary areas to ensure there are no impacts to undiscovered resources and to ensure that known resources are not impacted in an unanticipated manner. In the event that the CRS determines that full-time monitoring is not necessary in certain locations, a letter or e-mail providing a detailed justification for the decision to reduce the level of monitoring shall be provided to the CPM for review and approval prior to any reduction in monitoring.

CRMs shall keep a daily log of any monitoring or cultural resource activities and the CRS shall prepare a weekly summary report on the progress or status of cultural resources-related activities. The CRS may informally discuss cultural resource monitoring and mitigation activities with Energy Commission technical staff.

The CRS and the project owner shall notify the CPM by telephone or e-mail of any incidents of non-compliance with the conditions of certification and/or applicable LORS upon becoming aware of the situation. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the conditions of certification.

Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these conditions of certification.

A Native American monitor shall be obtained to monitor ground disturbance in areas where Native American artifacts may be discovered. Informational lists of concerned Native Americans and Guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that shall be monitored.

**Verification:** During the ground disturbance phases of the project, if the CRS wishes to reduce the level of monitoring occurring at the project, a letter or e-mail identifying the area(s) where the CRS recommends the reduction and justifying the reductions in monitoring shall be submitted to the CPM for review and approval. Documentation justifying a reduced level of monitoring shall be submitted to the CPM at least 24 hours prior to the date of planned reduction in monitoring.

During the ground disturbance phases of the project, the project owner shall include in the MCR to the CPM copies of the weekly summary reports prepared by the CRS regarding project-related cultural resources monitoring. Copies of daily logs shall be retained and made available for audit by the CPM.

Within 24 hours of recognition of a non-compliance issue with the conditions of certification and/or applicable LORS, the CRS and the project owner shall notify the CPM by telephone of the problem and of steps being taken to resolve the problem. The

telephone call shall be followed by an e-mail or fax detailing the non-compliance issue and the measures necessary to achieve resolution of the issue. Daily logs shall include forms detailing any instances of non-compliance. In the event of any non-compliance issue, a report written no sooner than two weeks after resolution of the issue that describes the issue, resolution of the issue and the effectiveness of the resolution measures, shall be provided in the next MCR.

One week prior to ground disturbance in areas where there is a potential to discover Native American artifacts, the project owner shall send notification to the CPM identifying the person(s) retained to conduct Native American monitoring. The project owner shall also provide a plan identifying the proposed monitoring schedule and information explaining how Native Americans who wish to provide comments will be allowed to comment. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the CPM. The CPM will either identify potential monitors or will allow ground disturbance to proceed without a Native American monitor.

**CUL-7** The project owner shall grant authority to halt construction to the CRS, alternate CRS and the CRMs in the event previously unknown cultural resource sites or materials are encountered, or if known resources may be impacted in a previously unanticipated manner (discovery). Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event cultural resources are found or impacts can be anticipated, construction shall be halted or redirected and shall remain halted or redirected until all of the following have occurred:

1. The CRS has notified the project owner, and the CPM has been notified within 24 hours of the discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning, including a description of the discovery (or changes in character or attributes), the action taken (i.e. work stoppage or redirection), a recommendation of eligibility and recommendations for mitigation of any cultural resources discoveries whether or not a determination of significance has been made.
2. The CRS and the project owner have consulted with the CPM and the CPM has concurred with the recommended eligibility of the discovery and proposed data recovery or other mitigation; and
3. Any necessary data recovery and mitigation has been completed.

**Verification:** At least 30 days prior to the start of ground disturbance, the project owner shall provide the CPM and CRS with a letter confirming that the CRS, alternate CRS and CRMs have the authority to halt construction activities in the vicinity of a cultural resource discovery, and that the project owner shall ensure that the CRS notifies the CPM within 24 hours of a discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning.

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# HAZARDOUS MATERIALS MANAGEMENT

Geoffrey Lesh, P.E. and Rick Tyler

## INTRODUCTION

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The purpose of this staff analysis is to determine if the proposed Roseville Energy Park (REP) project complies with applicable laws, ordinances, and regulations (LORS), and has the potential to cause significant impact on the public as a result of the use, handling or storage of hazardous materials at the proposed facility. If significant adverse impacts on the public are identified, Energy Commission staff must also evaluate the potential for facility design alternatives and additional mitigation measures to reduce impacts to the extent feasible.

This analysis does not address potential exposure of workers to hazardous materials used at the proposed facility. Staff's **Worker Safety and Fire Protection** analysis portion of this document describes the requirements applicable to the protection of workers from such risks.

The only hazardous material that would be stored at the REP in quantities exceeding the reportable amounts defined in the California Health and Safety Code, section 25532 (j), is aqueous ammonia (28 percent ammonia in water). The use of aqueous ammonia significantly reduces the risk that would otherwise be associated with use of the more economical anhydrous form of ammonia. Use of the aqueous form eliminates the high internal energy associated with the more hazardous anhydrous form, which is stored as a liquefied gas at elevated pressure. The high internal energy associated with the anhydrous form of ammonia can act as a driving force in an accidental release, which can rapidly introduce large quantities of the material to the ambient air and result in high down-wind concentrations. Spills associated with the aqueous form are much easier to contain and emissions are limited by the slow mass transfer from the surface of the spilled material.

Other hazardous materials stored in smaller quantities, such as mineral and lubricating oils, corrosion inhibitors and water conditioners, would be present at the proposed facility. However, these materials pose no significant potential for off-site impacts as a result of the quantities on-site, their relative toxicity, and/or their environmental mobility. Although no natural gas is stored, the project also involves the construction and operation of a natural gas pipeline and handling of large amounts of natural gas. Natural gas poses some risk of both fire and explosion. This pipeline would be approximately 6 miles in length (involving the construction and operation of one new compressor station).

The REP would also require the transportation of aqueous ammonia to the facility. Analysis of the potential for impact associated with such deliveries is addressed below.



## **LAWS, ORDINANCES, REGULATIONS, STANDARDS, AND POLICIES**

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The following federal, state, and local laws and policies apply to the protection of public health and hazardous materials management. Staff's analysis examines the project's compliance with these requirements.

### **FEDERAL**

The Superfund Amendments and Reauthorization Act of 1986 (Pub. L. 99-499, §301,100 Stat. 1614 [1986]), also known as SARA Title III, contains the Emergency Planning and Community Right To Know Act (EPCRA) as codified in 42 U.S.C. §11001 et seq. This Act requires that certain information about any release to the air, soil, or water of an extremely hazardous material must be reported to state and local agencies.

The Clean Air Act (CAA) of 1990 (42 U.S.C. §7401 et seq. as amended) established a nationwide emergency planning and response program and imposed reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials. The CAA section on Risk Management Plans - codified in 42 U.S.C. §112(r) - requires the states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of the CAA are reflected in the California Health and Safety Code, section 25531 et seq.

### **STATE**

The California Accidental Release Prevention Program (Cal-ARP), implemented pursuant to Health and Safety Code, section 25531, directs facility owners storing or handling acutely hazardous materials in reportable quantities to develop a Risk Management Plan (RMP) and submit it to appropriate local authorities, the United States Environmental Protection Agency (EPA), and the designated local Administering Agency for review and approval. The plan must include an evaluation of the potential impacts associated with an accidental release, the likelihood of an accidental release occurring, the magnitude of potential human exposure, any preexisting evaluations or studies of the material, the likelihood of the substance being handled in the manner indicated, and the accident history of the material. This program supersedes the California Risk Management and Prevention Plan.

Section 25503.5 of the California Health and Safety Code requires facilities which store or use hazardous materials to prepare and file a Business Plan with the local Certified Unified Program Authority (CUPA), in this case the City of Roseville Fire Department. This Business Plan is required to contain information on the business activity, the owner, a hazardous materials inventory, facility maps, an Emergency Response Contingency Plan, an Employee Training Plan, and other recordkeeping forms.

Title 8, California Code of Regulations, section 5189, requires facility owners to develop and implement effective safety management plans to ensure that large quantities of hazardous materials are handled safely. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process.

Title 8, California Code of Regulations, section 458 and sections 500 – 515, set forth requirements for design, construction and operation of vessels and equipment used to store and transfer anhydrous ammonia. These sections generally codify the requirements of several industry codes, including the ASME Pressure Vessel Code, ANSI K61.1 and the National Boiler and Pressure Vessel Inspection Code. While these codes apply to anhydrous ammonia, they may also be used to design storage facilities for aqueous ammonia.

California Health and Safety Code, section 41700, requires that “No person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.”

## **Gas Pipeline**

The safety requirements for pipeline construction vary according to the population density and land use, which characterize the surrounding land. The pipeline classes are defined as follows (Title 49, Code of Federal Regulations, Part 192):

- Class 1: Pipelines in locations within 220 yards of ten or fewer buildings intended for human occupancy in any 1-mile segment;
- Class 2: Pipelines in locations within 220 yards of more than ten but fewer than 46 buildings intended for human occupancy in any 1-mile segment. This class also includes drainage ditches of public roads and railroad crossings;
- Class 3: Pipelines in locations within 220 yards of more than 46 buildings intended for human occupancy in any 1-mile segment, or where the pipeline is within 100 yards of any building or small well-defined outside area occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12 month period (the days and weeks need not be consecutive); and
- Class 4: Pipelines in locations within 220 yards of buildings with 4 or more stories above ground in any 1-mile segment.

The natural gas pipeline will be designed for Class 3 service and will meet California Public Utilities Commission General Order 112-E and 58-A standards. The natural gas pipeline must be constructed and operated in accordance with the Federal Department of Transportation (DOT) regulations, Title 49, Code of Federal Regulations (CFR), Parts 190, 191, and 192:

- Title 49, Code of Federal Regulations, Part 190 outlines the pipeline safety program procedures;
- Title 49, Code of Federal Regulations, Part 191, Transportation of Natural and Other Gas by Pipeline; Annual Reports, Incident Reports, and Safety-Related Condition Reports, requires operators of pipeline systems to notify the U.S. Department of Transportation of any reportable incident by telephone and then submit a written report within 30 days;

- Title 49, Code of Federal Regulations, Part 192, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards, specifies minimum safety requirements for pipelines and includes material selection, design requirements, and corrosion protection. The safety requirements for pipeline construction vary according to the population density and land use which characterize the surrounding land. This part contains regulations governing pipeline construction, which must be, followed for Class 2 and Class 3 pipelines.

## **LOCAL AND REGIONAL**

The Uniform Fire Code (UFC 2000) contains provisions regarding the storage and handling of hazardous materials in Articles 4 and 79. The most recent version of the UFC was adopted in 2000.

The City of Roseville Fire Department is the designated Certified Unified Program Authority (CUPA) and is responsible for administering Hazardous Materials Business Plans, Hazardous Materials Management Plans, Spill Prevention, Control, and Countermeasure Plans and RMP's (CH2MHill 2004d).

## **SETTING**

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The proposed REP site is located on approximately 12 acres of a portion of a 40-acre parcel, owned by the City of Roseville in southwestern Placer County, located approximately 5 miles northwest of downtown Roseville, and about 18 miles northeast of the City of Sacramento. Site topography is characterized as generally flat with rolling foothills and the Sierra Nevada Mountains to the east, and the Sacramento Valley extending to the north, west and south. The terrain elevation is approximately 95 feet above mean sea level. The overall terrain in the vicinity slopes downward in a westward direction toward the Sacramento Valley. At present, the area surrounding the site is generally undeveloped with some agricultural uses. See **Project Description** portion of this document for more details.

Several factors associated with the area in which a project is to be located affect its potential to cause public health impacts from an accidental release of a hazardous material. These include:

- local meteorology;
- terrain characteristics; and
- location of population centers and sensitive receptors relative to the project.

## **METEOROLOGICAL CONDITIONS**

Meteorological conditions, including wind speed, wind direction and air temperature, affect the extent to which accidentally released hazardous materials would be dispersed into the air and the direction in which they would be transported. This affects the level of public exposure to such materials and the associated health risks. When wind speeds are low and stable, dispersion is severely reduced and can lead to increased localized public exposure in the event of an accidental release.

Recorded wind speeds and ambient air temperatures are described in the **Air Quality** section of the AFC (REP 2003, Section 8.1). Staff agrees with the applicant's use of F stability (stagnated air, very little mixing), 1.5 meters/second wind speed, and an ambient temperature of 111°F in its modeling analysis of an accidental release of aqueous ammonia. This is an extremely conservative scenario and reflects worst-case atmospheric conditions (CH2MHILL 2004a).

## **TERRAIN CHARACTERISTICS**

The location of elevated terrain (terrain above the power plant stack height) is often an important factor to be considered in assessing potential exposure. An emission plume resulting from an accidental release may impact high elevations before impacting lower elevations. The terrain in the vicinity of the site gradually slopes downhill from east to west. To the east, the terrain rises approximately 150-feet in 5 miles.

## **LOCATION OF EXPOSED POPULATIONS AND SENSITIVE RECEPTORS**

The general population includes many sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses. In addition, the location of the population in the area surrounding a project site may have a large bearing on health risk. The locations of sensitive receptors in the project vicinity are shown in Figure 8.9-2 of the AFC. There are no sensitive receptors within a 2-mile radius.

## **ENVIRONMENTAL IMPACTS**

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Staff reviewed and assessed the potential for the handling and use of hazardous materials during both construction and operations to impact the surrounding community. All chemicals proposed for use at the REP, as well as natural gas, were evaluated.

## **METHODOLOGY**

In order to assess the potential for released hazardous materials to travel off-site, and impact the public, staff analyzed several aspects of the proposed use of these materials at the facility. Staff recognizes that some chemicals must be used that are toxic. Therefore, staff conducted its analysis by examining the need for hazardous materials, the choice of chemical to be used and its amount, the manner in which the applicant will use the chemical, the manner it would be transported to the facility and transferred to facility storage tanks, and the way the applicant chooses to store the material on-site. Staff reviewed the applicant's proposed engineering controls and administrative controls concerning hazardous materials usage. Engineering controls are those physical or mechanical systems (such as storage tanks or automatic shut-off valves) which can prevent a spill of hazardous material from occurring or which can limit the spill to a small amount or confine it to a small area. Administrative controls are those rules and procedures that workers at the facility must follow that would help to prevent accidents or keep them small if they do occur. Both engineering and administrative controls can act as methods of prevention or as methods of response and

minimization. In both cases, the goal is to prevent a spill from moving off-site and causing harm to people.

Staff conducted a review and evaluation of the applicant's proposed use of hazardous materials as described by the applicant (Roseville 2003a, Section 8.5). Staff's assessment followed the five steps listed below:

- Step 1: Staff reviewed the chemicals and the amounts proposed for use as listed in Table 8.12-3R of the AFC and determined the need and appropriateness of their use;
- Step 2: Those chemicals, proposed for use in small amounts or whose physical state is such that there is virtually no chance that a spill would migrate off the site and impact the public, were removed from further assessment;
- Step 3: Measures proposed by the applicant to prevent spills were reviewed and evaluated. These included engineering controls such as automatic shut-off valves and different size transfer-hose couplings and administrative controls such as worker training and safety management programs;
- Step 4: Measures proposed by the applicant to respond to accidents were reviewed and evaluated. These measures also included engineering controls such as catchment basins and methods to keep vapors from spreading and administrative controls such as training emergency response crews; and
- Step 5: Staff then analyzed the theoretical impacts on the public worst-case spill of hazardous materials even with the mitigation measures proposed by the applicant. If the mitigation methods proposed by the applicant were found to be sufficient, no further mitigation would be required. If the proposed mitigation proposed by the applicant were found to be insufficient to reduce the potential for adverse impacts to an insignificant level, staff would then propose additional prevention and response controls until the potential for causing harm to the public was reduced to an insignificant level. It is only at this point that staff can recommend that the facility be allowed to use hazardous materials.

## **PROJECT IMPACTS**

### **Small Quantity Hazardous Materials**

In conducting the analysis, staff determined in Steps 1 and 2 that some materials, although present at the proposed facility, pose a minimal potential for off-site impacts as they will be stored in a solid form, in smaller quantities, have low mobility, or have low levels of toxicity.

In addressing the potential for impacts during the construction phase of the project, the only hazardous materials proposed for use include gasoline, fuel oil, hydraulic fluid, lubricants, solvents, cleaners, sealants, welding flux, paint, and paint thinner. Any impact of spills or other releases of these materials would be limited to the site due to the small quantities involved and thus no further analysis of construction phase activities appears warranted. These chemicals would be present in very small quantities – and some are solids, thus posing an insignificant risk of off-site impacts. Therefore, these hazardous materials were eliminated from further consideration.

Continuing with the assessment for the operational phase, after removing from consideration those chemicals that fit into Steps 1 and 2, staff continued with Steps 3, 4 and 5 to review the remaining hazardous materials: sodium hypochlorite, natural gas, sodium hydroxide, and aqueous ammonia.

## **Large Quantity Hazardous Materials**

### **Hydrochloric acid**

Hydrochloric acid, which is used in large quantities once every four years for the cleaning of the Heat Recovery Steam Generators (HRSG), does not pose a significant risk of off-site impacts because of the infrequent use and the safety measures taken by the HRSG cleaning company, including the use of temporary berms.

### **Sodium Hypochlorite**

According to the Table 8.5-3 (Roseville 2003a), 2000 gallons of sodium hypochlorite would be stored at the site. Sodium hypochlorite has a low potential to affect the off-site public because its vapor pressure is low and it is in an aqueous solution. In fact, hypochlorite is used at many such facilities as a substitute for chlorine gas, which is much more toxic and much more likely to migrate off-site because it is a gas and is stored in concentrated form under pressure. Thus, the use of a water solution of sodium hypochlorite is much safer to use than the alternative chlorine gas. The amount of sodium hypochlorite that would be stored on the site is below the Reportable Quantity as defined in the Cal-ARP regulations. Based upon staff's knowledge about the use of this material and the modeling of accidental releases, an aqueous solution of sodium hypochlorite poses an insignificant risk to the off-site public. However, the chances for accidental spills during transfer from delivery vehicles to the storage tanks should still be reduced as much as possible. Thus, measures to prevent transfer spills are extremely important and would be required as a standard condition in a Safety Management Plan for delivery of sodium hypochlorite (see Condition of Certification HAZ-3).

### **Sodium Hydroxide**

Sodium hydroxide would be stored on site but would not pose a risk of off-site impacts because it has relatively low vapor pressure and thus spills would be confined to the site. Therefore, no further analysis is needed.

### **Natural Gas**

Natural gas poses a fire and/or explosion risk as a result of its flammability. Natural gas is composed of mostly methane but also contains ethane, propane, nitrogen, butane, isobutane, and isopentane. It is colorless, odorless, and tasteless and is lighter than air. Natural gas can cause asphyxiation when methane is ninety percent in concentration. Methane is flammable when mixed in air at concentrations of 5 to 14 percent, which is also the detonation range. Natural gas, therefore, poses a risk of fire and/or explosions if a release were to occur. However, it should be noted that, due to its tendency to disperse rapidly (Lees 1998), natural gas is less likely to cause explosions than many other fuel gases such as

propane or liquefied petroleum gas. While natural gas would be used in significant quantities, it would not be stored on-site. The risk of a fire and/or explosion on-site can be reduced to insignificant levels through adherence to applicable codes and development and implementation of effective safety management practices.

In particular, gas explosions can occur in the HRSG and during start-up. The National Fire Protection Association (NFPA 85A) requires 1) the use of double block and bleed valves for gas shut-off; 2) automated combustion controls; and 3) burner management systems. These measures would significantly reduce the likelihood of an explosion in gas-fired equipment. Additionally, start-up procedures would require air purging of the gas turbines prior to start-up, thus precluding the presence of an explosive mixture. The safety management plan proposed by the applicant would address the handling and use of natural gas and significantly reduce the potential for equipment failure due to improper maintenance or human error.

Since the proposed facility would require the installation of a new gas pipeline off-site, impacts from this pipeline were evaluated.

The design of the natural gas pipeline is governed by laws and regulations discussed here. These LORS require use of high quality arc welding techniques by certified welders and inspection of welds. Many failures of older natural gas lines have been associated with poor quality gas welds. Many failures in older pipelines have also resulted from corrosion. Current codes address this failure mode by requiring use of corrosion resistant coatings and cathodic corrosion protection. Another major cause of pipeline failure is damage resulting from excavation activities near pipelines. Current codes address this mode of failure by requiring clear marking of the pipeline route. An additional mode of failure, particularly relevant to the project area, is damage caused by earthquake. Existing codes also address seismic hazard in design criteria (see discussion below). Evaluation of pipeline performance in recent earthquakes indicates that pipelines designed to modern codes perform well in seismic events while older lines frequently fail. Staff believes that existing regulatory requirements are sufficient to reduce the risk of accidental release from the pipeline to insignificant levels.

Failures of gas pipelines, according to data from the U.S. Department of Transportation (the National Transportation Safety Board) from the period 1984 - 1991, occur as a result of pipeline corrosion, pipeline construction or materials defects, rupture by heavy equipment excavating in the area such as bulldozers and backhoes, weather effects, and earthquakes. Given the gas line failures which occurred in the Marina District of San Francisco during the 1989 Loma Prieta earthquake, the January 1994 Northridge earthquake in Southern California, and the January 1995 gas pipeline failures in Kobe, Japan, as well as the January 19, 1995 gas explosion in San Francisco, the safety of the gas pipeline is of paramount importance. However, it must be noted that those pipelines, which failed, were older and not manufactured nor installed to modern code requirements. The February 2001 Nisqually Earthquake near Olympia Washington caused no damage to natural gas mains and there was only one reported gas line leak due to a separation of a service line going into a mobile home park.

The natural gas pipeline proposed for the REP facility might be designed, constructed, and owned by Pacific Gas & Electric Company (PG&E) or, alternately the City of Roseville may construct the pipeline and either own and operate it, or deed it back to PG&E (Roseville 2003a). In either case, the pipeline would be designed, constructed, and operated in accordance with Title 49, Code of Federal Regulations, part 192 and the California Public Utility Commission's General Order 112-E. Specifically, the pipeline will be designed in accordance with the standards required for gas pipelines in proximity to populated areas. If loss of containment occurs as a result of pipe, valve, or other mechanical failure or external forces, significant quantities of compressed natural gas could be released rapidly. Such a release can result in a significant fire and/or explosion hazard, which could cause loss of life and/or significant property damage in the vicinity of the pipeline route. However, the probability of such an event is extremely low if the pipeline is constructed according to present standards.

According to DOT statistics, the frequency of reportable incidents is about 0.25 for all pipeline incidents per 1,000 miles per year or  $2.5 \times 10^{-4}$  incidents per mile per year. DOT has also evaluated and categorized the major causes of pipeline failure. To summarize, the four major causes of accidental releases from natural gas pipelines are: Outside Forces-43 percent, Corrosion-18 percent, Construction/Material Defects-13 percent, and Other-26 percent. Outside forces are the primary causes of incidents. Damage from outside forces includes damage caused by use of heavy mechanical equipment near pipelines (e.g., bulldozers and backhoes used in excavation activities), weather effects, vandalism, and earthquake-caused rupture as seen in the Marina District of San Francisco during the 1989 Loma Prieta Quake and in Kobe, Japan in January 1995. The fourth category, "Other" includes equipment component failure, compressor station failures, operator errors, and sabotage. The average annual service incident frequency for natural gas transmission systems varies with age, the diameter of the pipeline, and the amount of corrosion.

Older pipelines have a significantly higher frequency of incidents. This results from the lack of corrosion protection and use of less corrosion resistant materials compared to modern pipelines, limited use of modern inspection techniques, and higher frequency of incidents involving outside forces. The increased incident rate due to outside forces is the result of the use of a larger number of smaller diameter pipelines in older systems, which are generally more easily damaged and the uncertainty regarding the locations of older pipelines.

In the United States, extensive federal and state pipeline codes and safety enforcement minimize the risk of severe accidents related to natural gas pipelines. As a result of changes made to Title 49, Code of Federal Regulations, part 192, that became effective on January 2004, the DOT Office of Pipeline Safety now requires operators to develop integrity management programs for gas transmission pipelines, and to perform ongoing assessments of pipeline integrity. These additional requirements decrease the probability of leak or rupture of the pipeline, and reduce what staff already considered an insignificant risk.



Staff believes the worst-case scenario for off-site natural gas hazard is a large rupture of the pipeline caused by improper use of heavy equipment near the pipeline. This worst-case scenario would not result in significant asphyxiation hazard since natural gas disperses to the atmosphere rapidly when released. The worst-case scenario is primarily a safety hazard to construction workers. The project owner would mark the pipeline in conformance with State and federal regulations to lower the probability of the above scenario.

The following safety features would be incorporated into the design and operation of the natural gas pipeline (as required by current federal and state codes): (1) while the pipeline will be designed, constructed, and tested to carry natural gas at a certain pressure, the working pressure will be less than the design pressure; (2) butt welds will be X-rayed and the pipeline will be tested with water prior to the introduction of natural gas into the line; (3) the pipeline will be surveyed for leakage annually (4) the pipeline will be marked to prevent rupture by heavy equipment excavating in the area; and (5) valves at the meter will be installed to isolate the line if a leak occurs.

### **Aqueous Ammonia**

Aqueous ammonia would be used at the REP in controlling the emission of oxides of nitrogen (NO<sub>x</sub>) from the combustion of natural gas in the facility. The accidental release of aqueous ammonia without proper mitigation can result in hazardous down-wind concentrations of ammonia gas. One 10,000-gallon tank would be used to store a maximum amount of 9,000 gallons of 28 percent aqueous ammonia solution (Roseville 2003a).

Based on the screening analysis discussed above, aqueous ammonia is one of the hazardous materials that may pose a risk of off-site impacts. The use of aqueous ammonia can result in the formation and release of toxic gases in the event of a spill even without interaction with other chemicals. This is a result of its moderate vapor pressure and the large amounts of aqueous ammonia, which would be used and stored on-site. However, as with aqueous sodium hypochlorite, the use of aqueous ammonia instead of the much more hazardous anhydrous ammonia (i.e., ammonia that is not diluted with water) poses far less risk.

To assess the potential impacts associated with an accidental release of ammonia, staff typically evaluates where four “bench mark” exposure levels of ammonia gas occur off-site. These include: 1) the lowest concentration posing a risk of lethality, 2,000 ppm; 2) the Immediately Dangerous to Life and Health (IDLH) level of 300 ppm; 3) the Emergency Response Planning Guideline (ERPG) level 2 of 150 ppm (recently changed from the 200 ppm value), which is also the RMP level 1 criterion used by U.S. EPA and California; and 4) the level considered by the Energy Commission staff to be without serious adverse effects on the public for a one-time exposure of 75 ppm. (A detailed discussion of the exposure criteria considered by staff and their applicability to different populations and exposure-specific conditions is provided in Appendix A of this analysis.) If the potential exposure associated with a potential release exceeds 75 ppm at any public receptor, staff presumes that the potential release poses a risk of significant impact. However, staff also assesses the probability of occurrence of the release and/or the nature of the potentially exposed

population in determining whether, the likelihood and extent of potential exposure are sufficient to support a finding of potentially significant impact.

Data Response 40 (CH2MHILL 2004a) provided the results of modeling for a worst-case accidental release of aqueous ammonia. The analysis assumed winds of 1.5 meters per second and atmospheric stability category F would exist at the time of the accidental release. An air temperature of 111° F was assumed. The SLAB (Ermak) air dispersion model was used to estimate airborne concentrations of ammonia. These analyses included many conservative assumptions, and were designed to predict the maximum possible impacts based on distance from the storage tank without regard to specific direction of transport.

The worst-case release is associated with a failure of the ammonia storage tank releasing all of its content into the secondary containment area, and the alternative scenario is a failure of a supply truck loading hose spilling aqueous ammonia onto the truck unloading pad with flow to the capture sump.

The results indicated that concentrations exceeding 75 ppm in the worst-case scenario would be present at 109 feet, which is entirely limited to the project site. There would be no off-site areas impacted by the 75-ppm concentration. Because the alternative scenario involves a much smaller volume of spill and assumes meteorological conditions that would increase dispersion of the vapor cloud, the maximum distance for that scenario would also be entirely within the site's fence line.

There are no sensitive receptors (schools, hospitals, day care centers, etc.) in a two-mile radius of the site. If and when the West Roseville Specific Plan (WRSP) is completed, there are planned to be built four schools that range in distance 0.4 to 0.9 miles from REP. A high density residential area is planned for approximately 0.3 miles west of REP. The WSRP allows no housing to be built within 1000 feet of the water treatment plant which is adjacent to REP's proposed site.

As there is an insignificant chance of a spill causing ammonia concentrations to exceed the 75 ppm de minimus level beyond the fence line of REP, staff believes that even with the likely build-out of the WRSP, there will still be no significant impact to the offsite public.

Staff reviewed the applicant's modeling calculations and found that due to the engineering controls proposed to be implemented by the applicant for the storage and transfer of aqueous ammonia, any accidental release of aqueous ammonia used for the project would not cause a significant impact.

## **Seismic Issues**

A hazardous materials spill could also occur during an earthquake, which would cause the failure of a hazardous materials storage tank. The quake could also cause the failure of the secondary containment system (berms and dikes) as well as electrically controlled valves, pumps, and neutralization systems. The failure of all these preventive control measures might then result in a vapor cloud of hazardous materials moving off-site and impacting the residents and workers in the surrounding community. This concern over earthquake safety is

heightened by the Loma Prieta earthquake of 1989, the Northridge earthquake of 1994, and the earthquake in Kobe, Japan in January 1995.

Information obtained after the January 1994 Northridge earthquake showed that some damage was caused to several large storage tanks and smaller tanks associated with the water treatment system of a cogeneration facility. Those tanks with the greatest damage - including seam leakage - were older tanks while the newer tanks sustained displacements and failures of attached lines. Therefore, staff conducted an analysis of the codes and standards, which should be followed in adequately designing and building storage tanks and containment areas to withstand a large earthquake. Staff also reviewed the impacts of the February 2001 Nisqually earthquake near Olympia, Washington, a state with similar seismic design codes as California. No hazardous materials storage tanks were impacted by this quake. Referring to the sections on **Geologic Hazards** and **Facility Design** in the AFC, staff notes that the proposed facility will be designed and constructed to the applicable standards of CCR Title 24 and the 2000 Uniform Building Code for Seismic Zone 3. Therefore, on the basis of what occurred in Northridge with older tanks and the lack of failures during the Nisqually earthquake with newer tanks, staff determined that tank failures during seismic events are not probable and do not represent a significant risk to the public.

### **Transportation of Hazardous Materials**

Hazardous materials, including aqueous ammonia, sodium hypochlorite, and others would be transported to the facility via tanker truck or shipping trucks. While many types of hazardous materials would be transported to the site, staff has found that transport of aqueous ammonia poses the predominance of risk associated with such transport. If the risks of transporting this hazardous material is insignificant, all other transportation risks would be insignificant as well.

Although an accidental release of aqueous ammonia during transportation to an Energy Commission-certified gas power plant is extremely unlikely, it is possible for aqueous ammonia to be released during a transportation accident. The extent of impact in the event of such a release would depend on the location and on the rate of dispersion of ammonia vapor from the surface of the aqueous ammonia pool. The likelihood of an accidental release during transport is dependent on three factors:

1. the skill of the tanker truck driver;
2. the type of vehicle used for transport; and
3. accident rate for hazardous materials transport trucks.

Staff routinely focuses on the surface streets within the project area after the delivery vehicle leaves the main highway. Staff believes that it is appropriate to rely on the extensive regulatory program that applies to shipment of hazardous materials on main California Highways to ensure safe handling in general transportation (see The Federal Hazardous Materials Transportation Law 49 USC §5101 et seq, The U.S. Department of Transportation Regulations 49 CFR Subpart H, §172-700, and California DMV Regulations on Hazardous Cargo). These regulations also address the issue of driver competence. (See AFC section

8.12.2. for additional information on regulations governing the transportation of hazardous materials.)

To address the issue of tank truck safety, aqueous ammonia would be delivered to the proposed facility in Department of Transportation (DOT) certified vehicles with design capacity of 6,000 gallons. These vehicles are designed to DOT Code MC-307. These are high integrity vehicles designed for hauling of caustic materials such as ammonia. Staff has therefore proposed Condition of Certification **HAZ-5** to ensure that regardless of which vendor supplies the aqueous ammonia, delivery would be made in a tanker, which meets or exceeds the specifications described by these regulations.

To address the issue of accident rates, staff reviewed the technical and scientific literature on hazardous materials transportation (including tanker trucks) accident rates in the United States and California. Staff relied on several references to determine the approach to preparing a hazardous materials transportation accident risk analysis (Rhyne, Davies, Harwood 1990, Harwood 1993, Vilchez, Pet-Armacost) supplemented with the following national data bases:

- National Response Center Data Base on chemical spills
- Chemical Incident Reports Center, U.S. Chemical Safety Board data base
- National Transportation Safety Board data base

Staff used this data and that from the Davies and Lee (1992) article, which references the 1990 Harwood study, to determine that the frequency of release for transportation of hazardous materials in the U.S. is between 0.06 and 0.19 releases per million miles traveled on well designed roads and highways. The maximum usage of aqueous ammonia each year of operation of the proposed REP would require about 24 - 36 tanker truck deliveries of aqueous ammonia per year (maximum of 2-3 trucks per month; Roseville 2003a). Each delivery truck would travel about 5 miles between State Route (SR) 65 and the facility per delivery along the designated transportation route (Blue Oaks Boulevard, then Fiddymont Road, then Phillip Road). The result is a maximum of 360 miles of delivery truck travel in the project area per year. Previous assessments by staff have found that the risk over this distance is negligible. The transportation route to be used for REP would consist of relatively new roads, some not yet built (ROSEVILLE 2003a). Built using the most recent DOT road safety standards, staff expects that this route will present safety risks lower than the already insignificant risks found in studies based on older accident data.

Data from the U.S. DOT show that the actual risk of a fatality over the past five years from all modes of hazardous material transportation (rail, air, boat, and truck) was approximately 0.1 in one million.

Staff, therefore, believes the risk of exposure to significant concentrations of aqueous ammonia during transportation to the facility are insignificant because of the remote possibility of accidental release of a sufficient quantity to present a danger to the public. The transportation of similar volumes of hazardous materials on the nation's highways is not unique nor an infrequent occurrence. Staff's analysis of the transportation of aqueous

ammonia to the proposed facility (along with data from the U.S. DOT) demonstrates that the risk of accident and exposure is less than significant.

Based on the environmental mobility, toxicity, quantities present at the site and frequency of delivery, it is staff's opinion that aqueous ammonia poses the predominate risk associated with hazardous materials transportation and use at the proposed facility. Based on this, staff concludes that the risk associated with transportation of other hazardous materials to the proposed facility does not significantly increase the risk of impact beyond that associated with ammonia transportation.

### **Site Security**

This facility proposes to use hazardous materials which have been identified by the U.S. EPA as materials where special site security measures should be developed and implemented to ensure that unauthorized access is prevented. The EPA published a Chemical Accident Prevention Alert regarding Site Security (EPA 2000a) and the U.S. Department of Justice published a special report on Chemical Facility Vulnerability Assessment Methodology (US DOJ 2002). In order to ensure that this facility or a shipment of hazardous material is not the target of unauthorized access, staff's proposed General Condition of Certification on Construction and Operations Security Plan **COM-8** in the **General Conditions** portion of this document would require the preparation of a Vulnerability Assessment and the implementation of Site Security measures consistent with the above-referenced documents.

The level of security should be dependent upon the threat imposed and the consequences of a successful breach of the facility boundaries. In order to determine the level of security, staff will provide guidance in the form of a decision matrix modeled after the U.S. Department of Justice Chemical Vulnerability Assessment Methodology (July 2002). Basic site security measures should be required at all locations in order to protect the infrastructure and electrical power generation within the state. These measures will include perimeter fencing, guards, alarms, law enforcement contact in the event of security breach, and fire detection systems. Other locations will have additional security measures dependant upon the results of the vulnerability assessment.

The level of security to be implemented at each power plant is a function of the likelihood of an adversary attack, the likelihood of adversary success in causing a catastrophic event, and the severity of consequences of that event. It is only after conducting a vulnerability assessment that the level of security required will be known. The vulnerability assessment will be based, in part, on the use and storage of certain quantities of acutely hazardous materials as described by the California Accidental Release Prevention Program (Cal-ARP - Health and Safety Code, section 25531). This will allow staff to use the results of the off-site consequence analysis prepared as part of the Risk Management Plan (RMP) to determine the severity of consequences of a catastrophic event.

Site personnel background checks will be required for this site and will most likely be limited to ascertaining that the employee's claims of identity and employment history are accurate. All site personnel background checks would be consistent with state and federal law regarding security and privacy.

Site access for vendors should be strictly controlled. Consistent with recent state and current federal regulations governing the transport of hazardous materials, hazardous materials vendors will have to maintain their transport vehicle fleet and employ only drivers properly licensed and trained. The project owner will be required, through the use of contractual language with vendors, to ensure that vendors supplying hazardous materials conduct background security checks on any employee involved in the transportation and delivery of hazardous materials to the power plant. This requirement will be similar to those conditions of certification which require a project owner to ensure that hazardous materials deliveries are made only in approved vehicles and only via an approved delivery route. All hazardous materials vendor delivery personnel background checks would be consistent with state and federal law regarding security and privacy.

## **CUMULATIVE IMPACTS**

Staff reviewed the potential for the operation of the REP combined with any existing or planned industrial facilities to result in cumulative impacts on the population within the area. Projects that could potentially contribute to cumulative impacts are those located or which will be located in the same geographic area of influence defined as within a 1-mile radius of the proposed power plant. Currently, the Pleasant Grove Waste Water Treatment Plant (PGWWTP) is within one mile of REP's proposed site. Additionally, the WRSP build-out plan contains areas zoned for industrial use that will also be within one mile of REP.

As REP does not present a significant potential for impacts beyond its boundaries, it does not present significant potential to contribute to cumulative impacts with other sources.

Staff finds that the as-proposed REP facility with the additional mitigation measures proposed by staff, poses a minimal risk of accidental release that could result in off-site impacts. It is also extremely unlikely that an accidental release that has very low probability of occurrence (about one in a million per year) would independently occur simultaneously at the REP and another facility at the same time.

## **APPLICANT'S PROPOSED MITIGATION**

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The potential for accidents resulting in the release of hazardous materials is greatly reduced by the implementation of a safety management program, which includes the use of both engineering and administrative controls. Administrative controls include the development and implementation of a Safety Management Plan. Elements of facility controls and the safety management plan are summarized below.

### **ENGINEERING CONTROLS**

Engineering controls help to prevent accidents and releases (spills) from moving off-site and impacting the community by incorporating engineering safety design criteria into the design of the facility. The engineered safety features proposed by the applicant for use at this facility include:

- construction of curbs, berms, and/or catchment basins in the hazardous materials storage areas to contain accidental releases that might happen during storage or delivery;
- physical separation of stored chemicals in separate containment areas in order to prevent accidental mixing of incompatible materials which may result in the evolution and release of toxic gases or fumes;
- construction of an underground spill containment vault with a wide 24-inch diameter drain from the aqueous ammonia secondary containment basin;
- a sloped containment pad for the aqueous ammonia tanker truck delivery area that will drain through into the same subsurface covered vault placed beneath the storage tank; and
- process protective systems including continuous tank level monitors, alarms, automatic shut-off valves, and fire protection systems.

## **ADMINISTRATIVE CONTROLS**

Administrative controls also help to prevent accidents and releases (spills) from moving off-site and impacting the community by establishing worker training programs and process safety management programs and by complying with all applicable health and safety laws, ordinances and standards.

The worker health and safety program proposed by the applicant for use at this facility would include (but is not limited to) the following elements:

- worker training regarding chemical hazards, health and safety issues, and hazard communication;
- the proper use of personal protective equipment;
- safety operating procedures for operation and maintenance of systems utilizing hazardous materials;
- fire safety and prevention; and emergency response actions including facility evacuation, hazardous material spill cleanup, and fire prevention.

At the facility, the project owner would designate an individual who has the responsibility and authority to ensure a safe and healthful workplace. The project health and safety professional oversees the health and safety program and has the authority to halt any action or modify any work practice in order to protect the workers, facility, and the surrounding community or in the event that the health and safety program is violated.

The facility's Safety Management Program would include regular inspection and maintenance of equipment, valves, piping, and appurtenances. Additionally, the safety management program requires that only trained facility personnel are assigned to the transfer and handling of hazardous chemicals. REP would also prepare a Hazardous Materials Business Plan and a Risk Management Plan (RMP).

In order to address the issue of spill response, REP would prepare and implement an Emergency Response Plan which includes information on: hazardous materials contingency and emergency response procedures, spill containment and prevention systems, personnel training, spill notification, on-site spill containment, prevention equipment and capabilities, etc. Emergency procedures will be established which include evacuation; spill cleanup, hazard prevention, and emergency response.

## STAFF'S PROPOSED MITIGATION

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Staff proposes eight conditions of certification mentioned throughout the text (above) and listed below. **HAZ-1** ensures that no hazardous material would be used at the facility except those listed in the AFC unless there is prior approval by the County and the Energy Commission Compliance Project Manager (CPM). **HAZ-2** requires that a RMP be prepared and submitted prior to the delivery of aqueous ammonia. The worst-case accidental release scenario evaluated in the AFC assumed that accidental spills of aqueous ammonia would occur from the storage tank into the catchment system. Staff believes that the most likely event resulting in a spill would be during transfer from the delivery tanker to the storage tank. Staff therefore proposes a condition (**HAZ-3**) requiring development of a safety management plan for the delivery of aqueous ammonia (as well as aqueous hypochlorite solution). The development of a Safety Management Plan addressing delivery of ammonia would further reduce the risk of any accidental release not addressed by the proposed spill prevention mitigation measures and the required Risk Management Plan (RMP). **HAZ-4** requires that the aqueous ammonia storage tank be designed to certain rigid specifications, **HAZ-5** addresses the transportation of aqueous ammonia, and **HAZ-6 and -7** address the safety of the gas pipeline.

## FACILITY CLOSURE

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The requirements for the handling of hazardous materials remain in effect until such materials are removed from the site regardless of facility closure. Therefore, Roseville Electric is responsible for continuing to handle such materials in a safe manner, as required by applicable laws. In the event that Roseville Electric abandons the facility in a manner, which poses a risk to surrounding populations, staff would coordinate with the California Office of Emergency Services, City of Roseville Fire Department, and the California Department of Toxic Substances Control (DTSC) to ensure that any unacceptable risk to the public is eliminated. Funding for such emergency action can be provided by federal, state, or local agencies until the cost can be recovered from the responsible parties.

## CONCLUSIONS AND RECOMMENDATIONS

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Staff's evaluation of the proposed project (with staff's proposed mitigation measures) indicates that hazardous materials use would pose little potential for significant impacts on the public. With adoption of the proposed conditions of certification, the proposed project would comply with all applicable Laws, Ordinances, Regulations and Standards (LORS). As previously discussed in this section under the topics of storage, transportation, and cumulative impacts of hazardous materials use, the construction and operation of the REP in



conjunction with the ultimate build-out of the WRSP will not contribute significant impacts to the public, nor change any of the conclusions herein. In response to Health and Safety Code, section 25531 et seq., the applicant would be required to develop an RMP. To insure adequacy of the RMP, staff's proposed conditions of certification require that the RMP be submitted for concurrent review by U.S. EPA, City of Roseville Fire Department, and Energy Commission staff. In addition, staff's proposed conditions of certification require City of Roseville Fire Department's review, and staff's review and approval of the RMP prior to delivery of any hazardous materials to the facility. Other proposed conditions of certification address the issue of the transportation, storage, and use of aqueous ammonia.

Staff recommends the Energy Commission impose the proposed conditions of certification, presented herein, to ensure that the project is designed, constructed and operated to comply with applicable LORS and to protect the public from significant risk of exposure to an accidental ammonia release.

## **PROPOSED CONDITIONS OF CERTIFICATION**

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**HAZ-1** The project owner shall not use any hazardous material not listed in Appendix B (AFC Table 8.5-3), below, or in greater quantities than those identified by chemical name in Appendix B, below, unless approved in advance by the City of Roseville Fire Department and the CPM.

**Verification:** The project owner shall provide to the Compliance Project Manager (CPM), in the Annual Compliance Report, a list of hazardous materials contained at the facility.

**HAZ-2** The project owner shall concurrently provide a Business Plan and a Risk Management Plan (RMP) to the Certified Unified Program Authority - CUPA (City of Roseville Fire Department) and the CPM for review at the time the RMP is first submitted to the U.S. Environmental Protection Agency (EPA). The project owner shall reflect all recommendations of the City of Roseville Fire Department and the CPM in the final documents. Copies of the final Business Plan and RMP, reflecting all comments, shall be provided to the CPM.

**Verification:** At least 60 days prior to receiving any hazardous material on the site, the project owner shall provide a copy of a final Business Plan to the CPM. At least 60 days prior to delivery of aqueous ammonia to the site, the project owner shall provide the final EPA-approved RMP, to the City of Roseville Fire Department and the CPM.

**HAZ-3** The project owner shall develop and implement a Safety Management Plan for delivery of aqueous ammonia and sodium hypochlorite and shall submit this plan to the CPM for approval. The plan shall include procedures, protective equipment requirements, training, and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of aqueous ammonia with incompatible hazardous materials.

**Verification:** At least 60 days prior to the delivery of aqueous ammonia or sodium hypochlorite to the facility, the project owner shall provide the plan to the CPM for review and approval.

**HAZ-4** The aqueous ammonia storage facility shall be designed to either the ASME Pressure Vessel Code and ANSI K61.6 or to API 620. In either case, the storage tank shall be protected by a secondary containment basin capable of holding 125% of the storage volume plus the volume associated with 24 hours of rain assuming the 25-year storm. The final design drawings and specifications for the ammonia storage tank and secondary containment basins shall be submitted to the CPM.

**Verification:** At least 60 days prior to delivery of aqueous ammonia to the facility, the project owner shall submit final design drawings and specifications for the ammonia storage tank and secondary containment basin to the CPM for review and approval.

**HAZ-5** The project owner shall direct all vendors delivering aqueous ammonia to the site to use only transport vehicles that meet or exceed the specifications of DOT Code MC-307.

**Verification:** At least 60 days prior to receipt of aqueous ammonia on site, the project owner shall submit copies of the notification letter to supply vendors indicating the transport vehicle specifications to the CPM for review and approval.

**HAZ-6** The project owner shall require that the gas pipeline undergo a complete design review and detailed inspection 30 years after initial startup and every 5 years thereafter.

**Verification:** At least 30 days prior to the initial flow of gas in the pipeline, the project owner shall provide an outline of the plan to accomplish a full and comprehensive pipeline design review to the CPM for review and approval. The full and complete plan shall be amended, as appropriate, and submitted to the CPM for review and approval, not later than one year before the plan is implemented by the project owner.

**HAZ-7** After any significant seismic event in the area where surface rupture occurs within one mile of the pipeline, the gas pipeline shall be inspected by the project owner.

**Verification:** At least 30 days prior to the initial flow of gas in the pipeline, the project owner shall provide a detailed plan to accomplish a full and comprehensive pipeline inspection in the event of a significant seismic event where surface rupture occurs within one mile of the pipeline to the CPM for review and approval. This plan shall be amended, as appropriate, and submitted to the CPM for review and approval, at least every five years.

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## APPENDIX A

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### HAZARDOUS MATERIAL MANAGEMENT

#### **BASIS FOR STAFF'S USE OF 75 PPM AMMONIA EXPOSURE CRITERIA**

Staff uses a health-based airborne concentration of 75 ppm to evaluate the significance of impacts associated with potential accidental releases of ammonia. While this level is not consistent with the 200-ppm level used by U.S. EPA and Cal/EPA in evaluating such releases pursuant to the Federal Risk Management Program and State Accidental Release Program, it is appropriate for use in staff's CEQA analysis. The Federal Risk Management Program and the State Accidental Release Program are administrative programs designed to address emergency planning and ensure that appropriate safety management practices and actions are implemented in response to accidental releases. However, the regulations implementing these programs do not provide clear authority to require design changes or other major changes to a proposed facility. The preface to the Emergency Response Planning Guidelines (ERPGs) states that "these values have been derived as planning and emergency response guidelines, **not** exposure guidelines, they do not contain the safety factors normally incorporated into exposure guidelines. Instead they are estimates, by the committee, of the thresholds above which there would be an unacceptable likelihood of observing the defined effects." It is staff's contention that these values apply to healthy adult individuals and are levels that should not be used to evaluate the acceptability of avoidable exposures for the entire population. While these guidelines are useful in decision making in the event that a release has already occurred (for example, prioritizing evacuations), they are not appropriate for and are not binding on discretionary decisions involving proposed facilities where many options for mitigation are feasible. CEQA requires permitting agencies making discretionary decisions to identify and mitigate potentially significant impacts through changes to the proposed project.

Staff has chosen to use the National Research Council's 30 minute Short Term Public Emergency Limit (STPEL) for ammonia to determine the potential for significant impact. This limit is designed to apply to accidental unanticipated releases and subsequent public exposure. Exposure at this level should not result in serious effects but would result in "strong odor, lacrimation, and irritation of the upper respiratory tract (nose and throat), but no incapacitation or prevention of self-rescue." It is staff's opinion that exposures to concentrations above these levels pose significant risk of adverse health impacts on sensitive members of the general public. It is also staff's position that these exposure limits are the best available criteria to use in gauging the significance of public exposures associated with potential accidental releases. It is, further, staff's opinion that these limits constitute an appropriate balance between public protection and mitigation of unlikely events, and are useful in focusing mitigation efforts on those release scenarios that pose real potential for serious impacts on the public. Table 1 provides a comparison of the intended use and limitations associated with each of the various criteria that staff considered in arriving at the decision to use the 75-ppm STPEL. Appendix B provides a summary of adverse effects, which might be expected to occur at various airborne concentrations of ammonia

## HAZARDOUS MATERIAL MANAGEMENT

### APPENDIX A TABLE 1

#### Acute Ammonia Exposure Guidelines

Guideline	Responsible Authority	Applicable Exposed Group	Allowable Exposure Level	Allowable* Duration of Exposures	Potential Toxicity at Guideline Level/Intended Purpose of Guideline
IDLH <sup>2</sup>	NIOSH	Workplace standard used to identify appropriate respiratory protection.	300 ppm	30 min.	Exposure above this level requires the use of "highly reliable" respiratory protection and poses the risk of death, serious irreversible injury or impairment of the ability to escape.
IDLH/10 <sup>1</sup>	EPA, NIOSH	Work place standard adjusted for general population factor of 10 for variation in sensitivity	30 ppm	30 min.	Protects nearly all segments of general population from irreversible effects
STEL <sup>2</sup>	NIOSH	Adult healthy male workers	35 ppm	15 min. 4 times per 8 hr day	No toxicity, including avoidance of irritation
EEGL <sup>3</sup>	NRC	Adult healthy workers, military personnel	100 ppm	Generally less than 60 min.	Significant irritation but no impact on personnel in performance of emergency work; no irreversible health effects in healthy adults. Emergency conditions one time exposure
STPEL <sup>4</sup>	NRC	Most members of general population	50 ppm 75 ppm 100 ppm	60 min. 30 min. 10 min.	Significant irritation but protects nearly all segments of general population from irreversible acute or late effects. One time accidental exposure
TWA <sup>2</sup>	NIOSH	Adult healthy male workers	25 ppm	8 hr.	No toxicity or irritation on continuous exposure for repeated 8 hr. work shifts
ERPG-2 <sup>5</sup>	AIHA	Applicable only to emergency response planning for the general population (evacuation) (not intended as exposure criteria) (see preface attached)	200 ppm	60 min.	Exposures above this level entail** unacceptable risk of irreversible effects in healthy adult members of the general population (no safety margin)

1) (EPA 1987) 2) (NIOSH 1994) 3) (NRC 1985) 4) (NRC 1972) 5) (AIHA 1989)

\* The (NRC 1979), (WHO 1986), and (Henderson and Haggard 1943) all conclude that available data confirm the direct relationship to increases in effect with both increased exposure and increased exposure duration.

\*\* The (NRC 1979) describes a study involving young animals, which suggests greater sensitivity to acute exposure in young animals. The (WHO 1986) warns that the young, elderly, asthmatics, those with bronchitis and those that exercise should also be considered at increased risk based on their demonstrated greater susceptibility to other non-specific irritants



## REFERENCES FOR APPENDIX A, TABLE 1

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## ABBREVIATIONS FOR APPENDIX A, TABLE 1

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ACGIH, American Conference of Governmental and Industrial Hygienists

AIHA, American Industrial Hygienists Association

EEGL, Emergency Exposure Guidance Level

EPA, Environmental Protection Agency

ERPG, Emergency Response Planning Guidelines

IDLH, Immediately Dangerous to Life and Health Level

NIOSH, National Institute of Occupational Safety and Health

NRC, National Research Council

STEL, Short Term Exposure Limit

STPEL, Short Term Public Emergency Limit

TLV, Threshold Limit Value

WHO, World Health Organization



**Hazardous Materials Management**  
**APPENDIX B – Roseville Energy Park Chemical Inventory**

Trade Name	Chemical Name	CAS <sup>1</sup> Number	Maximum Quantity Onsite	Hazardous Characteristics	RQ <sup>2</sup>	TPQ <sup>3</sup>	Prop 65
<b>Acutely Hazardous Materials:</b>							
NALCO 356	Cyclohexylamine (20 to 40%) Morpholine (5 to 10%)	108-91-8 110-91-8	400gal.	Corrosive	10,000 lb.	10,000 lb.	No
<b>Hazardous Materials:</b>							
Aqueous ammonia (28% solution)	Ammonium hydroxide	1336-21-6	10,000-gal.	Corrosive Volatile	1000 lb.		No
Sulfuric acid	Sulfuric acid	7664-93-9	2,000 gal.	Corrosive	1,000 lb.	1,000 lb.	No
Bleach	Sodium hypochlorite	7681-52-9	2,000 gal.	Corrosive	100 lb.		No
NALCO 7342	Sodium nromide	7647-15-6	800 gal.	Corrosive	(4)		No
NALCO TRASAR 23263		None	400 gal.	Non-hazardous	(4)		No
NALCO 7208	Trisodium phosphate	7601-54-9	400 gal.	Corrosive, toxic	5,000 lb.		No
NALCO STABREX ST70	Sodium hydroxide (1 to 5%)	1310-73-2	2000 gal.	Corrosive	1000 lb.		No
	Sodium hyprobromite (10 to 50%)	13824-96-9			(4)		No
NALCO 7330	Isothiazoline	261-72-554	55 gal.	Corrosive	(4)		No
NALCO 8305+	Sodium tolyltriazole	64665-57-2	800 gal.	Toxic	(4)		No
Hydrochloric acid	Hydrochloric acid	7647-01-0	4,500 lbs.	Corrosive	5,000 lb.		No
Citric acid	Hydroxy-propionic-tricarboxylic Acid	77-92-9	50 lbs.	Corrosive	(4)		No
Hydroxyacetic acid	Gyrolc acid	79-14-1	600 lbs.	Corrosive	(4)		No
Formic acid	Methanoic acid	64-18-6	350 lbs.	Corrosive	5,000 lb.		No
NALCO ELIMIN-OX	Carbohydrazide	497-18-7	400 gal.	Non-Hazardous			No
Anti-foam (e.g., NALCO 71 D5 ANTIFOAM)	Hydrotreated light distillate (10-20%)	6742-47-8	400 gal.	Combustible	(4)		No
		112-30-1					
	n-Decanol (1 to 5%)	118-87-5					
	n-Octanol (5 to 10%)						
Calcium sulfate	Calcium sulfate	10101-41-4	4,000 lbs.	Toxic	(4)		No
Chelating agents	Ethylenediaminetetra-acetic acid (EDTA)	60-00-4	55 gal.	Toxic	5,000 lbs.		No
Sodium sulfate	Sodium sulfate	7757-82-6	4,000 lb.	Toxic	(4)		No
Lubrication oil	Oil	None	12,000 gal.	Combustible	42 gal. <sup>5</sup>		Yes

**Hazardous Materials Management  
APPENDIX B – Roseville Energy Park Chemical Inventory**

Trade Name	Chemical Name	CAS <sup>1</sup> Number	Maximum Quantity Onsite	Hazardous Characteristics	RQ <sup>2</sup>	TPQ <sup>3</sup>	Prop 65
Mineral insulating oil	Oil	None	(all turbines) 55,000 gal. (total)	Combustible	42 gal. <sup>5</sup>		Yes
Sulfur hexafluoride	Sulfur hexafluoride	2551-62-4	200 lbs.	Inert	(4)		No
Diesel Fuel	Oil	None	400 gal.	Combustible	42 gal. <sup>5</sup>		Yes
Detergents	Various	None	100 gal.	Toxic	(4)		--
Lab reagents (liquid)	Various	None	10 gal.	Toxic	(4)		--
Lab reagents (solid)	Various	None	50 lbs.	Toxic	(4)		--
Ammonium bifluoride	Ammonium bifluoride	1341-19-7	100 lbs.	Toxic, Corrosive	100		No
Sodium bisulfite	Sodium bisulfite	7631-90-5	55 gal.	Corrosive	5,000 lbs		No
Sodium carbonate	Sodium carbonate	497-19-8	250 lbs.	Corrosive	(4)		No
Sodium nitrate	Sodium nitrate	7631-99-4	250 lbs.	Corrosive	(4)		No

<sup>1</sup> Chemical Abstract Service.

<sup>2</sup> Reportable Quantity per CERCLA. Release equal to or greater than RQ must be reported. Under California law, any amount that has a realistic potential to adversely affect the environment or human health or safety must be reported.

<sup>3</sup> Threshold Planning Quantity. Default TPQ for hazardous materials is 10,000 lb.

<sup>4</sup> No reporting requirement.

<sup>5</sup> Must report if does or will reach California state waters, or if quantity released is a "harmful quantity."

Source: Roseville Energy Park AFC, Table 8.5.3

# LAND USE

David Flores

## INTRODUCTION

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This land use analysis of the Roseville Energy Park (REP) focuses on two main issues: the project's consistency with local land use plans, ordinances and policies; and the project's compatibility with existing and planned land uses. In general, an electric generation project and its related facilities may be incompatible with existing and planned land uses if it creates unmitigated noise, dust, public health hazard or nuisance, traffic, or visual impacts, or when it unduly restricts existing or planned future uses.

## LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

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This section describes federal, state, regional, and local land use laws, ordinances, regulations, and standards (LORS) applicable to the proposed project.

### FEDERAL

There are no Federal land use-related LORS that apply to this project.

### STATE

#### **California Department of Education**

Education Code Section 17521 and the California Code of Regulations Title 5, sections 14001 through 14012, outline the powers and duties of the Department of Education (CDE) regarding future school site selection. The code section also provides distance requirements from hazardous pipelines and air emission sources that school districts are required to assess for school site selection. Although no schools are currently located within close proximity of the REP site, with the recent approval of the West Roseville Specific Plan by the City of Roseville, future school sites in the vicinity have been identified. Energy Commission staff will be assisting the CDE in providing specific data as needed to assure school site compliance with State law.

#### **Subdivision Map Act (Pub. Resources Code, § 66410-66499.58)**

The Subdivision Map Act provides procedures and requirements regulating land divisions (subdivisions) and the determining of parcel legality. Regulation and control of the design and improvement of subdivisions, by this Act, has been vested in the legislative bodies of local agencies. Each local agency by ordinance regulates and controls the initial design and improvement of common interest developments and subdivisions for which the Map Act requires a tentative and final map.

## LOCAL

### City of Roseville

#### **City of Roseville Zoning Ordinance**

The City of Roseville Zoning Ordinance (Title 19 of the Roseville Municipal Code) establishes land use (zone) districts in the incorporated areas of the City. In each specific land use district, the types of development, dimensions for buildings, and open spaces are regulated for the purpose of implementing the general plan of the city. The purposes of these regulations are protecting existing development, encouraging beneficial new development, and preventing overcrowding and congestion. **LAND USE Figure 1** shows the zoning districts in the area of the proposed project site.

#### **City of Roseville General Plan**

Under California State planning law, each incorporated City and County must adopt a comprehensive, long-term General Plan that governs the physical development of all lands under its jurisdiction. The general plan is a broadly scoped planning document and defines large-scale planned development patterns over a relatively long timeframe.

The General Plan consists of a statement of development policies and must include a diagram and text setting forth the objectives, principles, standards and proposals of the document. At a minimum, a General Plan has seven mandatory elements including Land Use; Circulation; Housing; Conservation; Open Space; Noise and Safety. The City of Roseville added a Public Facilities Element to their General Plan, which is discussed further in the **IMPACTS** section of this analysis.

The City of Roseville administers the State required general plan as a group of documents organized by geographic areas and subject matter and has included a Land Use element in its Plan (Government Code, § 65301). **LAND USE Figure 2** shows the general plan designations in the area of the proposed project site.

#### **West Roseville Specific Plan**

The City of Roseville adopted a resolution for approval of the West Roseville Specific Plan (WRSP) on February 4, 2004. The second reading was approved by the City Council on February 23, 2004. On April 6, 2004, Mr. Vance Jones with the City of Roseville Planning Department in a telephone conversation with staff indicated that the City anticipates that the Placer County Local Agency Formation Commission (LAFCO) will consider the West Roseville annexation request in July 2004.

**LAND USE Figure 3** shows land use designations under the WRSP. Land uses in the WRSP will include a mixed use planned developments of residential, industrial, commercial, park/open space, school sites, and public/quasi-public uses. As also shown in **Figure 3**, land immediately west of the project site is zoned General Industrial; to the east of the REP site, land will be preserved as open space and/or developed as a regional park.

## **Placer County**

### **Placer County General Plan**

Placer County administers the State required general plan as a group of documents organized by geographic areas and subject matter. (Government Code, § 65301).

Similar to the City of Roseville's General Plan, the Placer County General Plan includes specific policies designed to preserve and enhance existing development and to provide for orderly and appropriate new development to meet the needs of the area for the next 20 years.

### ***Land Use Element***

The Land Use Element addresses the types and locations of land uses (e.g., residential, industrial, commercial, agriculture, infrastructure such as roads, wastewater treatment, and utility facilities) that the County Supervisors consider appropriate for the long-range outlook of the General Plan.

The General Plan designation for lands adjacent to the north of the REP site that are not within the Roseville city limit is Agriculture.

### **Placer County Zoning Ordinance**

The Placer County Zoning Ordinance (Title 17 of the Placer County General Code) establishes land use (zone) districts in the unincorporated area. In each specific land use district, the types of development, dimensions for buildings, and open spaces are regulated for the purpose of implementing the general plan of the county. The purposes of these regulations are protecting existing development, encouraging beneficial new development, and preventing overcrowding and congestion. The areas north of the REP project site are within the Farm (F) district.

## **SETTING**

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### **SITE AND VICINITY DESCRIPTION**

The proposed Roseville Energy Park (REP) is to be built on a 12-acre portion of an approximately 40-acre parcel situated approximately one mile west of the City of Roseville boundary. However, both the REP plant site and the Pleasant Grove Waste Water Treatment Plant (PGWWTP) have been annexed by the City, thus creating a non-contiguous island of City property surrounded by Placer County land. The site is located north of Phillip Road. Access to the site will be from Phillip Road via a new access driveway. The site is located approximately 7 miles north of Interstate 80 and 5 miles northwest of State Highway 65.

The parcel is currently undeveloped and is currently being used as a construction staging and laydown area for the construction of the PGWWTP. The site was formerly used for rural residential purposes and grazing. With the site currently being used as a construction staging area, buildings associated with one of the former residences are being used for storage of materials and construction management activities.

## **SURROUNDING LAND USES**

### **Current**

Current land uses surrounding the site include large parcel agriculture, open space and livestock grazing. Specific surrounding uses are described as follows:

- North: Approximately 1,200 feet to the north of the project site is a rural residence and barn. A dog kennel/residence is located 850 feet to the northwest.
- South: The Pleasant Grove Waste Water Treatment Plant is approximately 2,000 feet south of the REP site.
- East: Rural residence and additional out buildings.
- West: Rural residence and outbuilding located 4,100 feet to the northwest.

Other uses in the vicinity of the REP site include the Del Webb Roseville Sun City community, approximately 1.2 miles east, the Robert Cooley Middle School, located approximately 2.7 miles east of the project site, and St. Clare Catholic Church, located approximately 4 miles south of the project site.

### **Planned**

As indicated earlier in this report, the West Roseville Specific Plan is proceeding through the final approvals (i.e., LAFCO annexation request and final boundary map review) stage, and the first phases of the housing developments are anticipated in early 2005. Proposed land uses within the specific plan include general industrial (located to the west of the PGWWTP); light industrial (west of and south of the PGWWTP); commercial, high-density, medium density and low-density residential; parks and recreation; open space; public/quasi-public areas and various proposed school locations (See **LAND USE –Figure 3** for proposed zoning under the WRSP).

## **IMPACTS**

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According to Appendix G of the Guidelines to the California Environmental Quality Act (CEQA), a project may have a significant effect on land use if a proposed project would:

- conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect;
- disrupt or divide the physical arrangement of an established community; or
- convert Prime Farmland, Farmland of Statewide Importance, or Unique Farmland to non-agricultural use.

A project may also have a significant impact on land use if it would create unmitigated noise, dust, public health hazard or nuisance, traffic, or visual impacts, or if it precludes or unduly restricts existing or planned future uses.

## **CONFORMITY WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS**

Public Resources Code § 25525 states that the Energy Commission shall not certify any facility when it finds "that the facility does not conform with any applicable state, local, or regional standards, ordinances, or laws, unless the [Energy] commission determines that such a facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving such public convenience and necessity. In making the determination, the commission shall consider the entire record of the proceeding, including, but not limited to the impacts of the facility on the environment, consumer benefits, and electric system reliability." In no event shall the commission make any finding in conflict with applicable federal law or regulation. When determining if a project is in conformance with state, local or regional ordinances or regulations, the Energy Commission typically meets and consults with applicable agencies to determine conformity and, when necessary, "to attempt to correct or eliminate any noncompliance" (§ 25523(d)(1)). The laws, ordinances, regulations, standards (LORS) and policies applicable to the project have been analyzed below to determine the extent to which the REP is consistent or at variance with each requirement or standard.

### **PROJECT SITE**

#### **State**

##### **Subdivision Map Act, 1972**

The REP site is comprised of three individual and separate legal parcels which encompasses 40 acres. The REP facilities would occupy approximately 12 acres of the property. The area within the power plant and switchyard fence lines will encompass 9.1 acres. Condition **LAND-3** would require that the project owner will obtain the necessary approvals from the City of Roseville to complete any lot merger or lot line adjustments necessary to ensure the proposed project, including associated facilities, will be located on a single legal lot which is in compliance with Section 18.10.010 of the Roseville Subdivision Ordinance.

##### **California Department of Education**

Although no schools are currently located within close proximity of the REP site, with the recent approval of the West Roseville Specific Plan by the City of Roseville, future school sites in the vicinity have been identified. The REP proposed several alternate gas pipeline routes in the AFC, but has since elected to withdraw from consideration the pipeline routes that were within 1,500 feet of any planned school facilities as identified in the West Roseville Specific Plan. With this reconsideration by REP, the preferred gas line route will not trigger any additional gas line risk analysis by the California Department of Education. There are no school sites planned within a quarter-mile (1,320 feet) of the REP which relate to CDE's requirement that school districts must make a public health finding if a school site would be within a quarter-mile of a potentially hazardous air-emissions source.

## City of Roseville General Plan/Land Use LORS and Policies

### ***Public Facilities Element***

The General Plan was adopted by Roseville's City Council in 1992 and a technical update was adopted in 2003. The General Plan reflects the values and contains the goals of the community regarding development. The City chose to incorporate a Public Facilities Element as an optional element into its General Plan to recognize the importance of establishing goals and policies related to public facilities. The following General Plan/Public Facilities goals and policies applicable to the REP project are listed below:

- **Goal 1:** Maintain a municipal electric utility that provides an efficient, economical, and reliable electric system.
- **Goal 2:** Provide electric services to all existing and future Roseville development **through** the City's Electric Utility. The provision of services by another provider may be considered where it is determined that such service is beneficial to the City and its utility customers or the provision of City services is not feasible.
- **Goal 3:** Maintain adequate resource reserves consistent with the industry standards, sound utility planning, and applicable conservation measures.
- **Goal 4: Aggressively** pursue cost-effective and environmentally safe alternate sources of energy and energy conservation measures.
- **Policies 1:** Secure new electric resources and transmission as necessary to meet projected demand levels.
- **Policies 2:** Provide improvements to the sub-transmission and distribution system, consistent with facility planning studies, to insure a reliable source of electricity is maintained.
- **Policies 3: Develop** siting and land use compatibility standard for energy facilities.
- **Policies 4:** Extend existing resource contracts if found to be in the best interest of the City.

To ensure that the REP conforms to the City of Roseville Zoning Code, staff is recommending that the Commission require the following Conditions of Certification:

- **LAND-1** would require that the applicant submit evidence of the City's review regarding compliance setback requirements, building elevations, temporary and permanent signs, parking requirements, and design and performance standards for the P/QP Zoning District;
- **LAND-2** would require that the applicant submit to the City of Roseville descriptions of the final laydown/staging areas for the City's review and comment; and
- **LAND-3** would require that the applicant shall obtain the necessary approval(s) from the City of Roseville for merger or lot line adjustment(s) necessary to ensure that the proposed project will be located on a single legal lot and owned by one entity.



## **West Roseville Specific Plan**

The West Roseville Specific Plan (Plan) does not specifically address the REP project as the Plan examines the potential project specific impacts of proposed developments within a 3,162 acre portion of land to be annexed into the City of Roseville's jurisdiction. The Plan contains guidance for areas to the west, east, and south of the REP project site and the Pleasant Grove Waste Water Treatment Plant. In order to provide sufficient buffers of the REP project from proposed residential developments, the Plan proposes industrial parks, Public/Quasi Public developments, and regional park components to assure public sensitivity of the REP and PGWWTP projects.

## **COMPATIBILITY WITH EXISTING AND PLANNED LAND USES**

### **Project Site**

The project would be constructed on a 12-acre portion of a 40-acre Public / Quasi-Public designated parcel owned by the applicant.

Of the various zoning districts in the City's Zoning Ordinance, the Public/Quasi-Public (P/QP) zoning district in which the project site is located is the most appropriate zoning district for a power plant, which is intended to provide for general power production and passive power production facilities. Power plants are specifically listed as a compatible use in the "P/QP" District subject to a conditional permit. Since the City is the applicant, the City would not generally issue itself a conditional use permit, but would proceed through a process that mirrors the conditional use permit process. The City Council would act as the approval body, rather than the Planning Commission, and coordinate the referral agencies with the City to discuss potential conditions of approval. The City would then forward their proposed conditions to the Energy Commission which may incorporate Roseville's items as conditions of certification into the Commission's REP licensing process. The project complies with all of the applicable development standards (lot and yard requirements) set forth in the Zoning Ordinance for the "P/QP" District. Staff is currently working with the City of Roseville Planning Department to obtain additional conditions of certification for compliance with its local LORS. Any additional condition requirements will be reflected in the Final Staff Assessment.

The construction lay down area for REP would be immediately north of the power plant's structural footprint within the boundaries of the project site and, therefore, would not conflict with existing or planned land uses. Temporary, construction-related impacts, such as increased noise and dust, may affect adjacent land uses. With mitigation, these construction impacts are not expected to be significant. Please see the **AIR QUALITY** and **NOISE** sections of the FSA for discussions of impacts and mitigation. Staff has found that operation of the REP would not cause significant, unmitigated adverse noise, dust, public health hazard or nuisance, or traffic impacts on nearby land uses.

Existing land uses in the vicinity of the site consist of a waste water treatment plan, rural residential uses, a dog kennel, and various agriculturally related operations. The REP project's construction and operation phase would not preclude residents and other users

of the recreational facilities located in the City of Roseville or within Placer County from pursuing community activities.

Staff believes that the project's consistency with: 1) the City's land use designation and zoning for the site; and 2) the current development pattern for the area established by the City of Roseville is consistent with the General Plan and zoning ordinance, and that the REP is an allowed and compatible use for the area. The proposed REP development will be compatible with the current surrounding agricultural activities. Staff believes that the existing waste water treatment facility in the vicinity is compatible with surrounding uses, and the REP will be a similar industrial use.

### **Consistency and Compatibility with Planned Land Uses in the West Roseville Specific Plan**

As provided in the West Roseville Specific Plan, a significant amount of development characterized as primary mixed use with residential, commercial, industrial, and light industrial development will occur within close proximity of the REP project.

From the land use planning perspective, staff has concerns with residential developments, such as an apartment complex, being located very close to an industrial sector. **LAND USE Figure 3** indicates that the West Roseville industrial sector would include the waste water treatment plant, the REP, and currently unknown industrial uses between the REP and a high density residential zone. Staff's measurements indicate that the WRSP high density residential zone would be approximately 1,000 feet from the REP, 900 feet from the waste water treatment plant, and approximately 60 feet from the WRSP industrially designated area. Staff would prefer to see a non-industrial buffer such as regional open space extended to the area west of the REP similar to that planned to the east. Such a buffer would be in addition to that provided by the REP's proposed landscape/screening proposal.

Staff contacted various local agencies such as the Sacramento Area Council of Governments and Sacramento County Planning Department to determine if separation criteria with distances between urban land uses such as residential development and industrial activities had been established. In all instances, the response was that no distance criteria had been established, but factors such as noise levels, lighting issues, and the type of industrial use can be a factor in determining the width of a buffer. In discussions with the California Department of Education, distance limits have been addressed for purposes of health and safety requirements. An example taken from their School Site Selection and Approval Guide addresses any existing or proposed facility within a quarter mile of a proposed school site that might reasonably be anticipated to emit hazardous air emissions. If a proposed school site is located within that distance, the local education agency must make findings that the facility does not constitute a public health risk.

With the industrial and high density developments being planned for the third phase of development within the WRSP, staff believes that there is some time for both the developers of the WRSP and the applicant to consider provision of additional open space areas to the west of this planned development.

## **Conversion of Farmland**

The 40-acre parcel containing the site does not have a land conservation contract. Also, the property is not within a Williamson Act preserve or a Farmland Security Zone. The linear facilities do not cross Williamson Act preserve lands or a Farmland Security Zone.

The proposed plant site is located within the Roseville City Limits. Although the site and the surrounding area are not currently urbanized, the project site has not been used as a farming headquarters or the surrounding area for cattle grazing for over 5 years. There are no significant agricultural uses in the vicinity of the project site or the natural gas pipeline route; therefore, there will be no impact on agriculture.

## **Linear Facilities**

### **Disruption or Division of an Established Community**

The natural gas line alignment would temporarily affect land currently being used in agricultural production (cattle grazing). The topsoil in the areas to be disturbed would be removed during the construction period and temporarily converted to non-agricultural use by this project. Soil surface would be returned to the original grades and agricultural use upon completion of construction activities. Therefore, no existing farmlands would be permanently converted to non-agricultural use for the REP's natural gas pipeline facilities. The impacts would be less than significant.

As discussed earlier in this report, the proposed natural gas pipeline route would be installed within dedicated right-of-ways along local roads. They would not affect adjacent residential activities.

## **CUMULATIVE IMPACTS**

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The proposed project is consistent with the City of Roseville's (City) long-range land use policies for this industrially-designated area as expressed in the City's General Plan/West Roseville Specific Plan. Conformance with the General Plan/West Roseville Specific Plan is the primary consideration in determining a project's potential to contribute to adverse cumulative land use impacts. Therefore, projects that are consistent with the City's long-range land use policies are not viewed as adverse from a cumulative impact perspective. The West Roseville Specific Plan (WRSP) sets forth the City's long-range vision for the physical development of this incorporated area, and other plans for infrastructure and public services are based on this long-range vision.

The WRSP envisions both long-term continuation of residential, industrial and commercial development in the site vicinity. At this time, there are no other project proposals in the vicinity of the REP project. As indicated earlier in this report, it is anticipated that LAFCO will approve the annexation of 3,162 acres of land into the City of Roseville's jurisdiction which encompasses the West Roseville proposal. The REP project is consistent with the City's long-range planning policies for industrial development in this area; therefore, cumulative land use impacts are not considered significant.

The proposed project is not expected to make a significant contribution to regional impacts related to new development and growth. The REP is planned to serve the City of Roseville's existing and anticipated electrical needs of its jurisdictional boundaries.

## **FACILITY CLOSURE**

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At some point in the future, the proposed facility would cease operation and close down. At that time, it would be necessary to ensure that closure occurs in such a way that public health and safety and the environment are protected from adverse impacts.

The planned lifetime of the REP plant is estimated at thirty years. At least twelve months prior to the initiation of decommissioning, the applicant would prepare a Facility Closure Plan for Energy Commission review and approval. This review and approval process would be public and allow participation by interested parties and other regulatory agencies. At the time of closure, all applicable LORS would be identified and the closure plan would discuss conformance of decommissioning, restoration, and remediation activities with these LORS. All of these activities would fall under the authority of the Energy Commission.

There are at least two other circumstances under which a facility closure can occur: unexpected temporary closure and unexpected permanent closure. Staff has not identified any LORS from a land use perspective that the applicant would have to comply with in the event of unexpected temporary closure or unexpected permanent closure of the REP.

## **CONCLUSIONS**

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1. Staff believes that the project is consistent with the City's land use designation and zoning for the site.
2. The project would not disrupt or divide the physical arrangement of an established community. The community of Del Webb Roseville Sun City is approximately 1.2 miles away respectively from the subject property.
3. The project would not preclude or restrict existing or planned land uses, or the conduct of agricultural uses on neighboring properties. However staff has concerns about the close proximity of the West Roseville Specific Plan's proposed high density residential zone to the REP, the existing waste water treatment plant, and the Plan's proposed industrial area.
4. With mitigation, operation of the project would not cause any significant noise, dust, public health, traffic, or visual impacts to nearby land uses, nor would the operation of the REP contribute substantially to any cumulative land use impacts.
5. With the lot merger of the three legal parcels as provided under Condition of Certification **LAND-3**, this will bring the parcels under conformance with the City of Roseville's Subdivision Ordinance, specifically Section 18.10.010.

If the project is approved, staff recommends that the Commission adopt the following proposed Conditions of Certification.

## **PROPOSED CONDITIONS OF CERTIFICATION**

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**LAND-1** The project owner shall prepare a site development plan that complies with the applicable design criteria and performance standards for the General Industrial District set forth in the City of Roseville Zoning Ordinance. The site development plan must contain the following features:

- Setbacks (i.e. yard area requirements) for structures;
- Building elevations;
- Landscaping requirements;
- Temporary and permanent signs for project identification; permanent and construction phase signs);and
- Permanent parking lot design, showing the quantity and dimension of spaces.

Following preparation of the above site development plan, the project owner shall design and construct the project consistent with the applicable design criteria and performance standards for the General Industrial District set forth in the City of Roseville Zoning Ordinance.

**Verification:** At least 60 days prior to the start of construction, the project owner shall concurrently submit the site development plan to the CPM and the City of Roseville Planning Department. The material submitted to the CPM must include documentation that the City of Roseville Planning Department has been given the opportunity to review and comment on the plan and its compliance or conformance the above-referenced requirements.

Monthly Compliance Reports submitted to the CPM must contain a written statement from the CBO that the project is being constructed in compliance with the site development plan.

**LAND-2** The project owner shall provide descriptions of the final laydown/staging areas identified for project construction to the Director of the City of Roseville Planning Department for review and comment, and the CPM for review and approval. The description shall include:

- (a) Assessor's Parcel numbers;
- (b) addresses;
- (c) land use designations;
- (d) zoning;
- (e) site plan showing dimensions;
- (f) owner's name and address (if leased); and,

(g) duration of lease (if leased); and, if a discretionary permit was required, copies of all discretionary and/or administrative permits necessary for site use as lay down/staging areas.

**Verification:** The project owner shall provide the specified documents at least 30 days prior to the start of any ground disturbance activities.

**LAND-3** The project owner shall obtain the necessary approval(s) from the City of Roseville and complete any lot merger or lot line adjustments necessary to ensure that the proposed project, including associated facilities and improvements, but excluding linear facilities, will be located on a single legal lot and owned by one entity. That single lot shall include sufficient buffer areas to protect the health and safety of current or future occupants of adjacent lots. It shall remain a single lot for the life of the power plant.

**Verification:** At least 30 days prior to the start of construction, the Project Owner shall provide the CPM with proof of completion of the above adjustments or satisfactory evidence that no such adjustments are necessary. Prior to submitting an application to the City, the project owner shall submit the proposed lot configuration to the CPM for review and approval.

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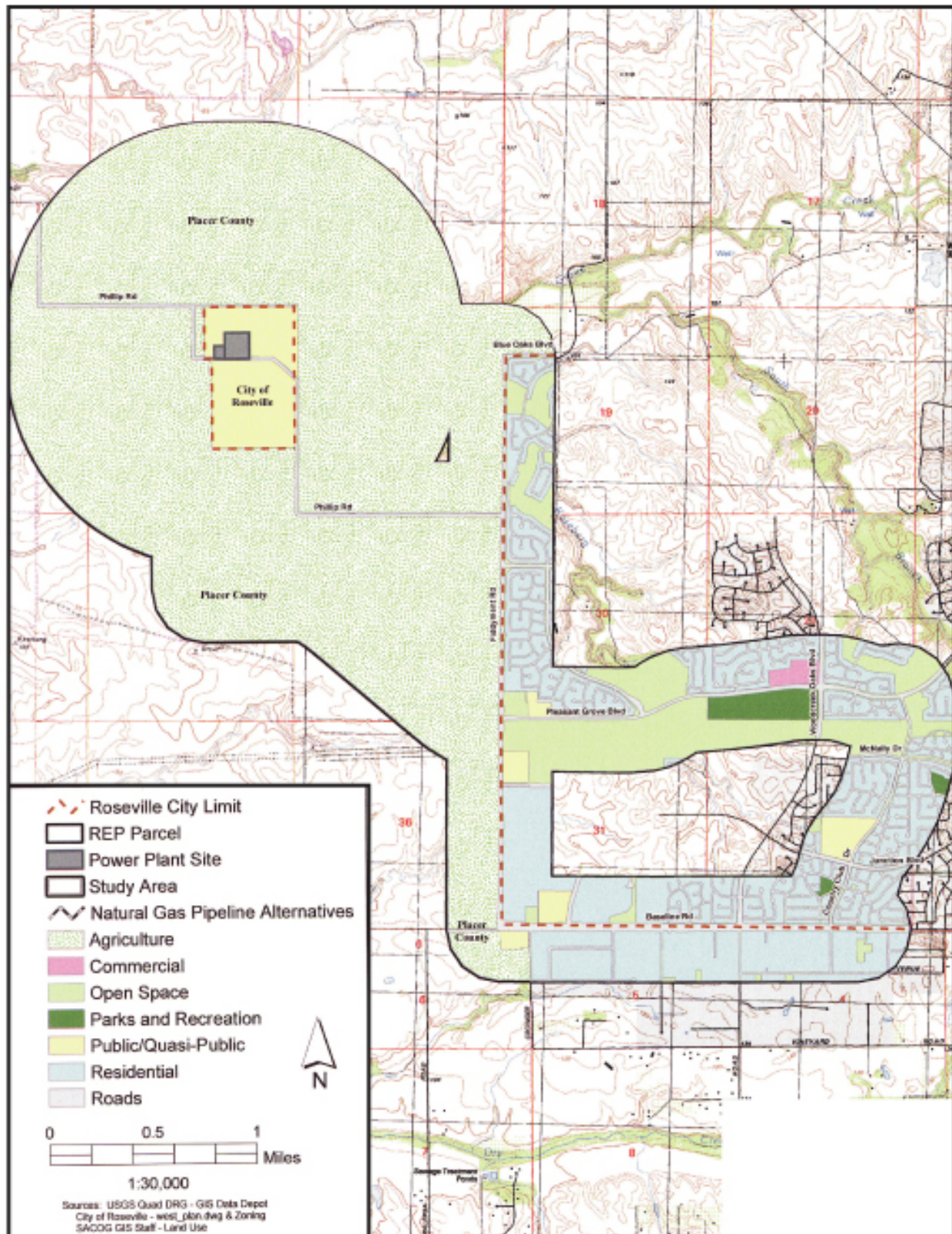
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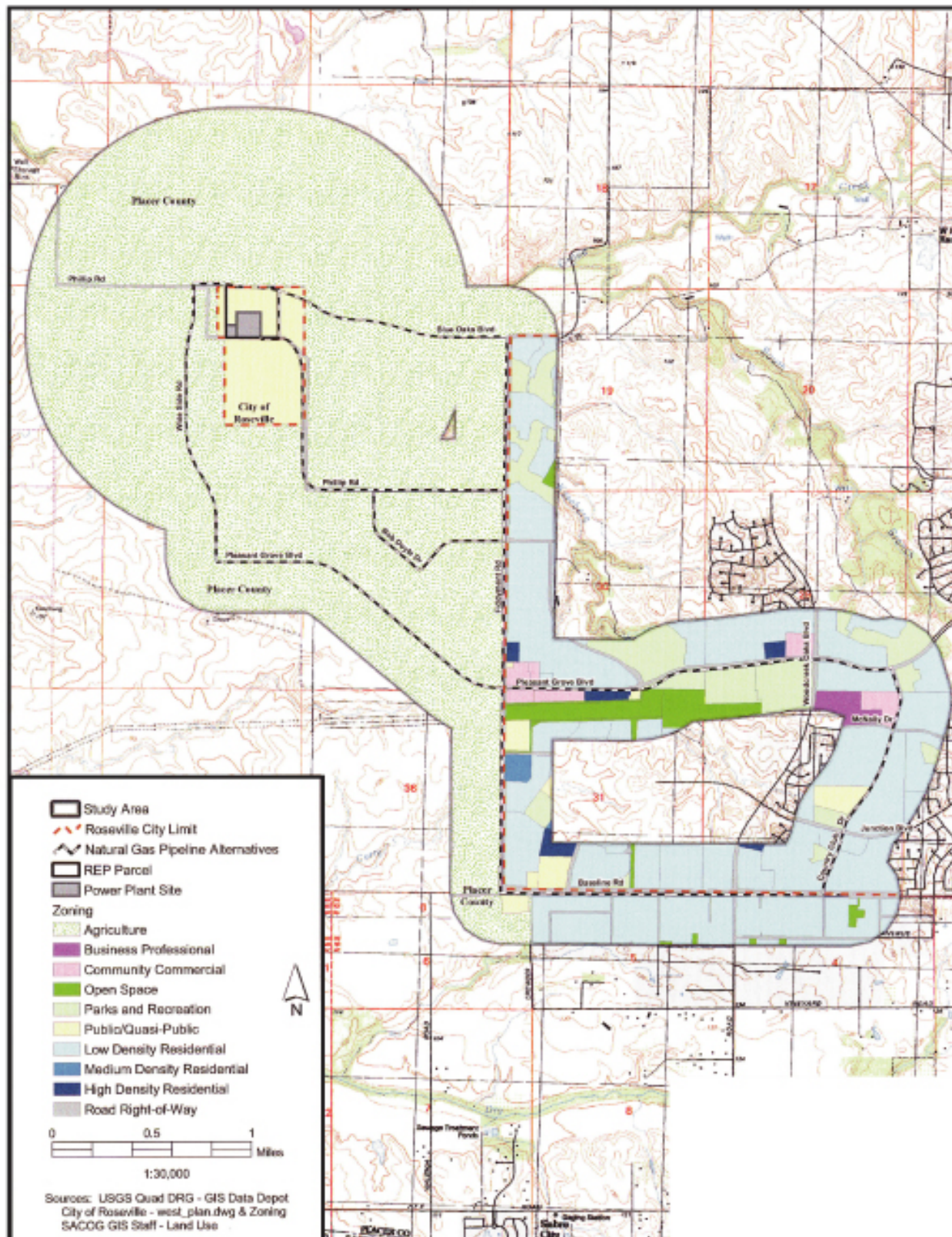
**LAND USE - Figure 1**  
**Roseville Energy Park - General Plan Land Use Map**



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2004  
 SOURCE: Roseville Energy Park AFC, Figure 8.6-2



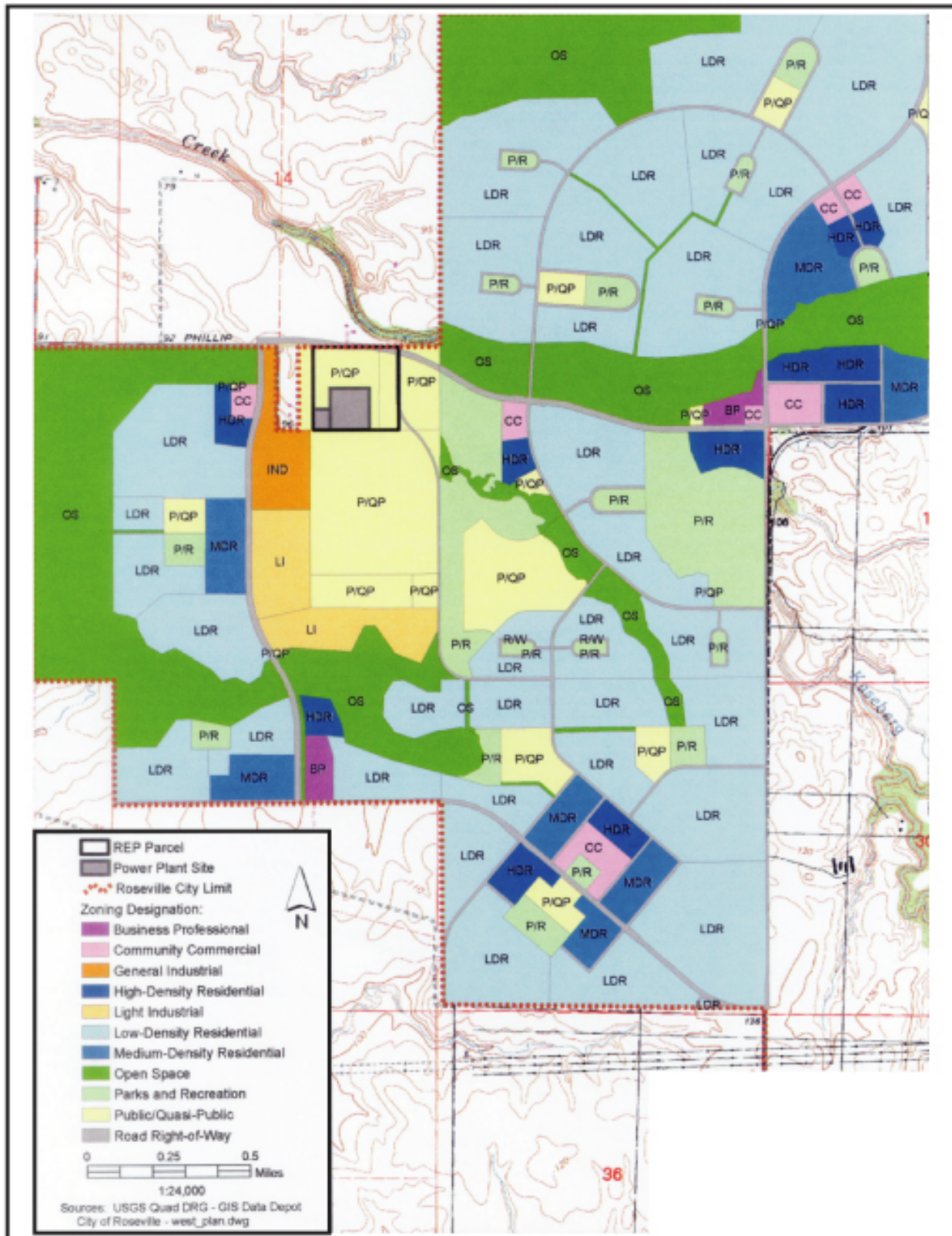
**LAND USE - Figure 2**  
**Roseville Energy Park - Zoning Map**



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2004  
 SOURCE: Roseville Energy Park AFC, Figure 8.6-3



**LAND USE - Figure 3**  
**Roseville Energy Park - West Roseville Specific Plan Zoning Map**



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2004  
 SOURCE: Roseville Energy Park AFC, Figure 8.8-5

# NOISE AND VIBRATION

Shahab Khoshmashrab, Kevin Robinson and Steve Baker

## INTRODUCTION

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The construction and operation of any power plant creates noise, or unwanted sound. The character and loudness of this noise, the times of day or night that it is produced, and the proximity of the facility to sensitive receptors combine to determine whether the facility would meet applicable noise control laws and ordinances, and whether it would cause significant adverse environmental impacts. In some cases, vibration may be produced as a result of power plant construction practices, such as blasting or pile driving. The ground-borne energy of vibration has the potential to cause structural damage and annoyance.

The purpose of this analysis is to identify and examine the likely noise and vibration impacts from the construction and operation of the Roseville Energy Park (REP), and to recommend procedures to ensure that the resulting noise and vibration impacts would be adequately mitigated to comply with applicable laws, ordinances, regulations, and standards (LORS). For an explanation of technical terms employed in this testimony, please refer to **NOISE Appendix A** immediately following.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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### FEDERAL

Under the Occupational Safety and Health Act of 1970 (OSHA) (29 U.S.C. § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 C.F.R. § 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise exposure levels as a function of the amount of time during which the worker is exposed (see **NOISE Appendix A, Table A4** immediately following this section). The regulations further specify a hearing conservation program that involves monitoring the noise to which workers are exposed, assuring that workers are made aware of overexposure to noise, and periodically testing the workers' hearing to detect any degradation.

There are no federal laws governing off-site (community) noise.

The Federal Transit Administration (FTA) has published guidelines for assessing the impacts of ground-borne vibration associated with construction of rail projects, which have been applied by other jurisdictions to other types of projects. The FTA-recommended vibration standards are expressed in terms of the "vibration level," which is calculated from the peak particle velocity measured from ground-borne vibration. The FTA measure of the threshold of perception is 65 VdB, which correlates to a peak particle velocity of about 0.002 inches per second (in/sec). The FTA measure of the threshold of architectural damage for conventional sensitive structures is 100 VdB, which correlates to a peak particle velocity of about 0.2 in/sec.

## STATE

California Government Code section 65302(f) encourages each local governmental entity to perform noise studies and implement a noise element as part of its General Plan. In addition, the California Office of Planning and Research has published guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure. The State land use compatibility guidelines are listed in **NOISE Table 1**.

**NOISE Table 1**  
**Land Use Compatibility for Community Noise Environment**

LAND USE CATEGORY		COMMUNITY NOISE EXPOSURE - Ldn or CNEL (dB)																				
		50			55			60			65			70			75			80		
Residential - Low Density Single Family, Duplex, Mobile Home																						
Residential - Multi-Family																						
Transient Lodging – Motel, Hotel																						
Schools, Libraries, Churches, Hospitals, Nursing Homes																						
Auditorium, Concert Hall, Amphitheaters																						
Sports Arena, Outdoor Spectator Sports																						
Playgrounds, Neighborhood Parks																						
Golf Courses, Riding Stables, Water Recreation, Cemeteries																						
Office Buildings, Business Commercial and Professional																						
Industrial, Manufacturing, Utilities, Agriculture																						
	<b>Normally Acceptable</b>	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.																				
	<b>Conditionally Acceptable</b>	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design.																				
	<b>Normally Unacceptable</b>	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.																				
	<b>Clearly Unacceptable</b>	New construction or development generally should not be undertaken.																				

Source: State of California General Plan Guidelines, Office of Planning and Research, June 1990.

The State of California, Office of Noise Control, prepared a Model Community Noise Control Ordinance, which provides guidance for acceptable noise levels in the absence

of local noise standards. The Model also contains a definition of a simple tone, or “pure tone,” in terms of one-third octave band sound pressure levels that can be used to determine whether a noise source contains annoying tonal components. The Model Community Noise Control Ordinance further recommends that, when a pure tone is present, the applicable noise standard should be lowered (made more stringent) by five dBA.

Other State LORS include the California Occupational Safety and Health Administration (Cal-OSHA) regulations.

## **Cal-OSHA**

Cal-OSHA has promulgated Occupational Noise Exposure Regulations (Cal. Code Regs., tit. 8, §§ 5095-5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards (see **NOISE Appendix A, Table A4**).

## **LOCAL**

### **City of Roseville General Plan**

Chapter IX of the City’s General Plan (Roseville 2003) is the City of Roseville’s Noise Element. The applicable noise standards for various uses are expressed in Table IX-3, Performance Standards for Non-Transportation Noise Sources, summarized below in **NOISE Table 2**. These standards declare that noise impacts on noise-sensitive receptors be no greater than 50 dBA  $L_{eq}$  during daytime hours (7 a.m. to 10 p.m.), and no greater than 45 dBA  $L_{eq}$  during nighttime hours (10 p.m. to 7 a.m.).

**NOISE Table 2**  
**City of Roseville Noise Performance Standards**

Noise Level Descriptor*	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly $L_{eq}$ , dB	50	45
Maximum level, dB	70	65

\*Measured at the property line of the noise-sensitive receptor

### **City of Roseville Noise Regulation**

The City’s Noise Ordinance restricts the times of day, and the days of the week, that construction may occur near residentially-zoned property (Roseville 2001, § 9.24.030 G). Construction is permitted:

- weekdays between 7:00 a.m. and 7:00 p.m.; and
- weekends between 8:00 a.m. and 8:00 p.m.

The Noise Regulation repeats the standards of the General Plan Noise Element shown in **NOISE Table 2** (Roseville 2001, § 9.24.100, Table 1). Further, the Noise Regulation prohibits noise created on industrially-zoned land, when heard at a sensitive receptor that is adjacent or is separated by a roadway, to cause the noise level at the property

line of the sensitive receptor to exceed the ambient level by 7 dBA, or to exceed the standards (**NOISE Table 2**) by 7 dBA, whichever is greater (Roseville 2001, § 9.24.120).

### **Placer County Noise Ordinance**

The Placer County Noise Ordinance sets Sound Level Standards for sound that causes the ambient noise level to increase by 5 dBA, or that exceeds certain values, as shown in **NOISE Table 3** below, whichever is greater (Placer 2004, § 9.36.060, Table 1):

**NOISE Table 3**  
**Placer County Sound Level Standards**

Noise Level Descriptor*	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly $L_{eq}$ , dB	55	45
Maximum level, dB	70	65

\*Measured at the property line of the noise-sensitive receptor

## **SETTING**

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### **PROJECT BACKGROUND**

The Roseville Energy Park involves the construction and operation of a nominal 120-125 MW baseload/160 MW peaking combined cycle power plant. The REP would include either two General Electric LM6000PC Sprint or two Alstom GTX100 gas turbine generators with heat recovery steam generators (HRSGs), and one steam turbine generator with a mechanical draft evaporative cooling tower. Also included in the project would be a natural gas compression station (Roseville 2003a, AFC §§ 1.1, 2.1, 2.2.1, 2.2.2, 2.2.6).

The equipment that has the greatest potential to generate significant noise levels includes the gas turbines, HRSGs, steam turbine, pumps, main transformers, natural gas fuel compressors, wet cooling tower, and a zero liquid discharge facility (Roseville 2003a, AFC § 8.7.2.3).

### **Power Plant Site**

The project site is located within the City of Roseville, on land owned by the City. It is zoned Public/Quasi-Public, and is directly north of the Pleasant Grove Waste Water Treatment Plant (PGWWTP). Surrounding land uses currently include ranching (agricultural grazing) and rural residential. Agricultural land to the north of the site is located in unincorporated Placer County. To the west, east, and south of the project and the PGWWTP is a 3,100-acre area called West Roseville, which will be developed for residential, industrial, and commercial uses over 15 years under the West Roseville Specific Plan (WRSP) (Roseville 2003a, AFC §§ 1.1, 2.2.1, 8.6.1.2, 8.7.1).

### **Linear Facilities**

Linear facilities included in the project would consist of the following:

- a 50-foot-long pipeline to supply tertiary treated recycled wastewater from the City of Roseville's adjacent PGWWTP;
- a 60 kV switchyard to deliver the plant's power directly to the grid through a double-circuit 60kV transmission line located adjacent to the project site;
- approximately 6 miles of 10- to 16-inch diameter underground natural gas pipeline to deliver fuel from the existing PG&E gas distribution line 123 to the project site;
- an approximately 800 foot pipeline to convey sanitary waste water to the PGWWTP's influent junction structure, located east of the project site (Roseville 2003a, AFC §§ 1.1, 2.2.5, 2.2.6, 2.2.7).

## EXISTING NOISE LEVELS

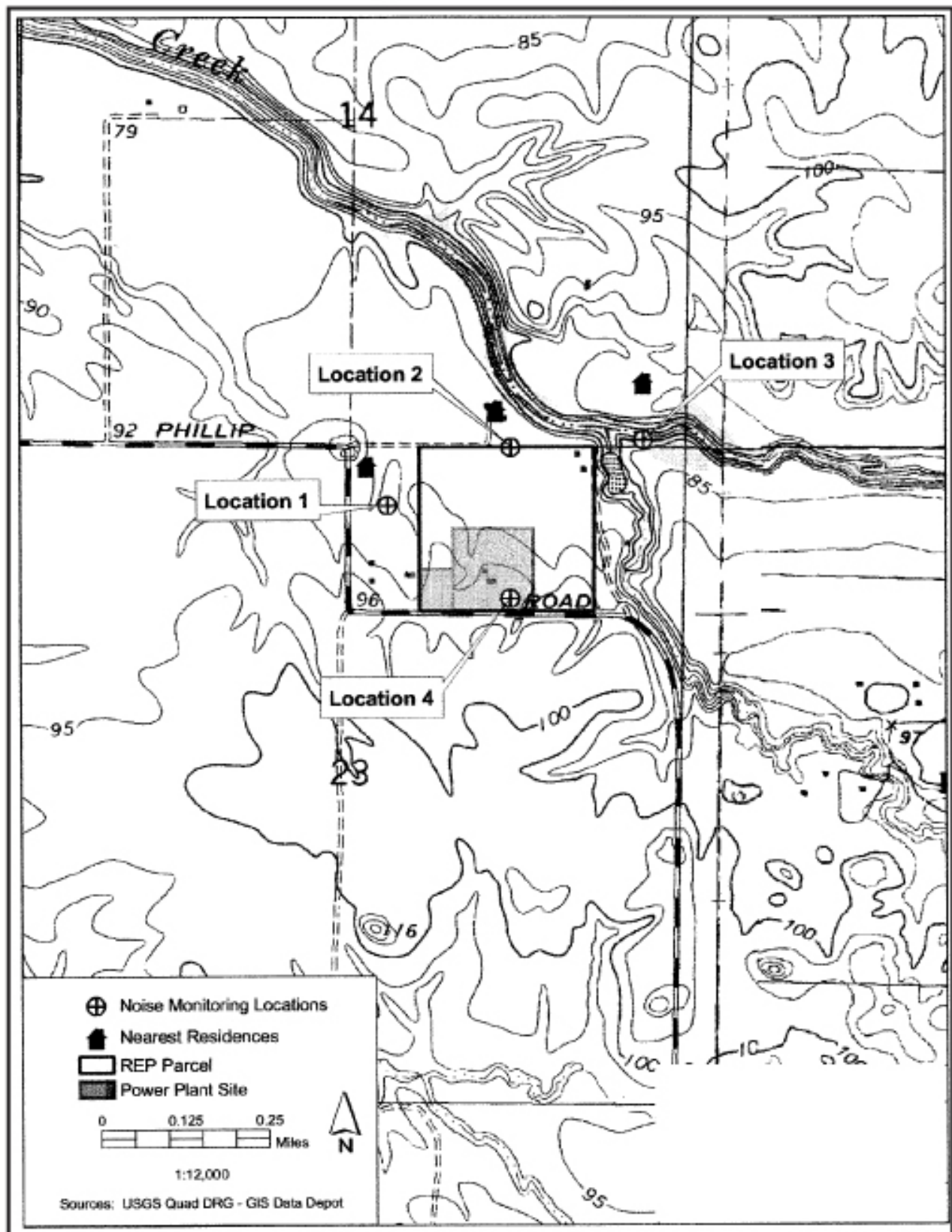
In order to predict the likely effects of project noise on adjacent sensitive receptors, the applicant commissioned an ambient noise survey of the area. The survey was conducted on Thursday and Friday, July 10 and 11, 2003, using acceptable equipment and techniques. The noise survey monitored existing noise levels at the following four locations, shown on **NOISE Figure 1**:

1. Location 1: Adjacent to residence and dog kennel at 5480 Phillip Road, approximately 1,115 feet northwest of a point midway between the two HRSG stacks of the power plant (assumed, for purposes of modeling power plant noise emissions, as the point source of plant noise). Existing noise is due primarily to the barking of dogs housed in indoor kennel spaces located 300 feet north of the monitoring site and outdoor pens located within 50 feet of the monitoring site; intermittent traffic on Phillip Road, 330 feet west of the monitoring site; occasional aircraft; and infrequent noise related to construction of the PGWWTP.
2. Location 2: Adjacent to residence at 5490 Phillip Road, approximately 1,125 feet north of a point midway between the two HRSG stacks of the power plant. Existing noise is due to the same sources as at Location 1.
3. Location 3: Adjacent to residence at 4900 Phillip Road, approximately 1,815 feet northeast of a point midway between the two HRSG stacks of the power plant. The primary existing sources of noise in this location are birds and insects. Secondary sources include intermittent traffic on Phillip Road, occasional aircraft, and infrequent noise related to construction of the PGWWTP.
4. Location 4: On the center point of the south boundary of the site, approximately 440 feet south of a point midway between the two HRSG stacks of the power plant. It is not located near any sensitive receptor and was selected to provide data representative of traffic on Phillip Road. Existing noise consists primarily of intermittent traffic on Phillip Road. Secondary sources include low-level pump noise at the PGWWTP, air conditioning units on distant construction trailers, birds, insects, occasional aircraft, and infrequent noise related to construction of the PGWWTP (Roseville 2003a, AFC § 8.7.1).





**NOISE - Figure 1**  
**Roseville Energy Park - Noise Monitoring Locations**



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2004  
 SOURCE: Roseville Energy Park 03-AFC-1, Figure 8.7-1

**NOISE Table 4** summarizes the ambient noise measurements (Roseville 2003a, AFC § 8.7.1.2, Table 8.7-1).

**NOISE Table 4**  
**Summary of Measured Noise Levels**

Measurement Sites	Measured Noise Levels, dBA		
	Average During Nighttime Hours		Community Noise Equivalent Level (CNEL)
	L <sub>eq</sub>	L <sub>90</sub>	
1 – 5480 Phillip Road residence	41.1	37.6	50.8
2 – 5490 Phillip Road residence	37.8	35.6	46.8
3 – 4900 Phillip road residence	38.8	35.9	49.1
4 – South boundary of site	44.1	40.4	52.7

Source: Roseville 2003a, AFC Table 8.7-1 and staff calculations

In general, the noise environment in the vicinity of the project site is dominated by dogs barking, traffic, and aircraft noise during the day and by insect noise at night. The area is relatively quiet at the present time because of its distance from typical urban activities.

## EXPECTED FUTURE AMBIENT NOISE LEVELS

### Proposed West Roseville Specific Plan (WRSP)

On February 23, 2004, the Roseville City Council passed the West Roseville Specific Plan (WRSP), a 3,162-acre plan for the development of the land that lies to the west, south and east of the REP. Construction of the residential, commercial and professional buildings, parks, schools and other uses that will comprise the WRSP is expected to commence in summer 2004, with the first residents moving into their new homes in 2005. The REP is expected to begin construction in the spring of 2005, and to commence commercial operation in summer 2006 (Roseville 2003a, AFC §§ 1.4, 1.6.3). Since WRSP sensitive receptors (especially residences) will exist before the REP begins operation, it is necessary to analyze the likely noise impacts of the project on these new receptors. For this reason, staff submitted a data request to the applicant (DR #48) requesting that the applicant predict the project's noise impacts on WRSP receptors.

In response to staff's data request, the applicant performed noise modeling to estimate project noise levels at the nearest planned WRSP residential areas to the west, northeast, east and southwest of the REP site (CH2MHill 2004a, DR #48). These projections are shown in **NOISE Table 10**, later in this analysis. Estimates were developed based on modeled noise levels assuming only geometric spreading losses. The estimates are therefore conservative, as atmospheric and other attenuating effects are not considered.

These predicted future roadway noise levels, as indicated in the WRSP EIR, for roadways adjacent to or near these residential areas, account for the increase in ambient noise that will be present in the future, when West Roseville is fully developed.

## IMPACTS

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### CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act requires that significant environmental impacts be identified, and that such impacts be eliminated or mitigated to the extent feasible. Section XI of Appendix G of CEQA Guidelines (Cal. Code Regs., tit. 14, App. G) sets forth some characteristics that may signify a potentially significant impact. Specifically, a significant effect from noise may exist if a project would result in:

1. exposure of persons to, or generation of, noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies;
2. exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
3. substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or
4. substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

The Energy Commission staff, in applying item c) above to the analysis of this and other projects, has concluded that a potential for a significant noise impact exists where the noise of the project plus the background exceeds the background by 5 dBA  $L_{90}$  or more at the nearest sensitive receptor.

Staff considers it reasonable to assume that an increase in background noise levels up to 5 dBA in a residential setting is insignificant; an increase of more than 10 dBA is clearly significant. An increase between 5 and 10 dBA should be considered adverse, but may be either significant or insignificant, depending on the particular circumstances of a case.

Factors to be considered in determining the significance of an adverse impact as defined above include:

1. the resulting noise level <sup>1</sup>;
2. the duration and frequency of the noise;
3. the number of people affected;
4. the land use designation of the affected receptor sites; and
5. public concern or controversy as demonstrated at workshops or hearings, or by correspondence.

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<sup>1</sup> For example, a noise level of 40 dBA would be considered quiet in many locations. A noise limit of 40 dBA would be consistent with the recommendations of the California Model Community Noise Control Ordinance for rural environments, and with industrial noise regulations adopted by European jurisdictions. If the project would create an increase in ambient noise no greater than 10 dBA at nearby sensitive receptors, and the resulting noise level would be 40 dBA or less, the project noise level would likely be insignificant.

Noise due to construction activities is usually considered to be insignificant in terms of CEQA compliance if:

- 1 the construction activity is temporary;
- 2 use of heavy equipment and noisy activities is limited to daytime hours; and
- 3 all industry-standard noise abatement measures are implemented for noise-producing equipment.

Noise impacts associated with the project can be created by short-term construction activities, and by normal long-term operation of the power plant.

## PROJECT SPECIFIC IMPACTS — CONSTRUCTION

### Community Effects

#### General Construction Noise

Construction noise is usually considered a temporary phenomenon. Construction of the REP is expected to last approximately 18 to 21 months (Roseville 2003a, AFC §§ 1.4, 8.7.2.2). Construction of an industrial facility such as a power plant is typically noisier than permissible under usual noise ordinances. In order to allow the construction of new facilities, construction noise during certain hours of the day is commonly exempt from enforcement by local ordinances. The City of Roseville Noise Ordinance places no limit on the level of construction noise, but limits such noise to certain hours (Roseville 2001, § 9.24.030.G). As described above, construction hours are restricted to:

- weekdays 7:00 a.m. to 7:00 p.m.
- weekends 8:00 a.m. to 8:00 p.m.

The applicant has predicted construction noise impacts at the sensitive receptors (Roseville 2003a, AFC Table 8.7-3). These predicted construction noise impacts are summarized in **NOISE Table 5**.

**NOISE Table 5**  
**Construction Noise Impact Predictions**

Location	Distance from Noise Source (feet)	Loudest Predicted Sound Level, dBA*
5480 Phillip Road residence	1115	62
5490 Phillip Road residence	1125	62
4900 Phillip Road residence	1815	58

Source: Roseville 2003a, AFC Table 8.7-3

\*Does not include steam blows

The loudest predicted sound levels at these receptors vary from 58 to 62 dBA. During the daytime, when noisy construction work is performed,  $L_{eq}$  levels at these locations range from 40 dBA to as high as 50 dBA (Roseville 2003a, AFC Table 8.7-1). Construction noise levels will be 8 to 22 dBA above the existing daytime  $L_{eq}$  levels. Thus, average construction noise will cause a temporary adverse noise impact.

## Steam Blows

Typically, the loudest noise encountered during construction, inherent in building any project incorporating a steam turbine, is created by the steam blows. After erection and assembly of the feed water and steam systems, the piping and tubing that comprises the steam path has accumulated dirt, rust, scale and construction debris such as weld spatter, dropped welding rods and the like. If the plant were started up without thoroughly cleaning out these systems, all this debris would find its way into the steam turbine, quickly destroying the machine.

In order to prevent this, before the steam system is connected to the turbine, the steam line is temporarily routed to the atmosphere. Traditionally, high pressure steam was then raised in the heat recovery steam generator or a temporary boiler and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a steam blow, was quite effective at cleaning out the steam system. A series of short steam blows, lasting two or three minutes each, was performed several times daily over a period of two or three weeks. At the end of this procedure, the steam line was connected to the steam turbine, which was then ready for operation.

These high-pressure steam blows could produce noise as loud as 136 dBA at a distance of 50 feet. In order to reduce disturbance from steam blows, the applicant has committed to equipping the steam blow piping with a silencer that would reduce noise levels by approximately 30 dBA (Roseville 2003a, AFC § 8.7.2.2).

In recent years, a new, quieter steam blow process, variously referred to as QuietBlow™ or Silentsteam™, has become popular. This method utilizes lower pressure steam over a continuous period of 36 hours or so. Resulting noise levels reach about 80 dBA at 100 feet. Noise levels at nearby receptors are typically similar to the ambient background noise level, and thus barely noticeable. Even more recently, compressed air has been substituted for steam in the continuous blow process, with resulting noise levels that are similar.

The applicant has predicted steam blow noise levels at the nearest sensitive receptors; see **NOISE Table 6**. Comparing to ambient  $L_{eq}$  noise levels, it is seen that noise from high pressure steam blows would exceed normal daytime  $L_{eq}$  ambient noise at all three receptors by as much as 31 to 39 dBA (see **NOISE Table 4**). This represents short-term noise levels at these residences that are eight to sixteen times as loud as the ambient. While this might represent a substantial adverse impact, staff believes that the temporary nature of the noise, combined with the small number of receptors, makes such a process permissible.

**NOISE Table 6**  
**Steam Blow Noise Impact Predictions**

Location	Distance from Source (feet)	Predicted Sound Level, dBA	
		High Pressure Steam Blow	Low Pressure Steam Blow
5480 Phillip Road Residence	1115	79	53
5490 Phillip Road Residence	1125	79	53
4900 Phillip Road Residence	1815	75	49

Source: Roseville 2003a, AFC Table 8.7-3

In order to minimize annoyance due to steam or air blows, staff proposes conditions of certification to limit noise from the short duration, high-pressure steam blows by requiring the use of a temporary silencer to achieve the noise level cited above, to implement a notification process to make neighboring land uses aware of impending steam blows (see proposed Conditions of Certification **NOISE-4** and **NOISE-5** below), and to restrict such work to daytime hours (see proposed Condition of Certification **NOISE-8**). If a low-pressure, continuous steam or air blow process is used, the proposed Condition of Certification **NOISE-4** will ensure that the resulting continuous noise levels do not exceed the LORS nighttime noise standards, or cause a significant increase in nighttime ambient noise levels. This should ensure the process is tolerable to residents and adjacent land uses.

### **REP's Construction Noise Impacts on West Roseville Neighborhoods**

REP construction noise will cause a temporary adverse noise impact on the nearest WRSP sensitive receptors. At the time the REP construction gets underway, some of the WRSP residential buildings may be under construction, in which case there will be no people residing there. At the same time, other buildings may have already been built and occupied, in which case the implementation of the planned sound mitigation measures between the West Roseville neighborhoods and the REP (as described below and in the AFC) will be well under way. These measures will help to mask the construction noise from the REP. Therefore, the expected adverse impacts from the construction of the REP will likely have less impact on these residences than on the existing three receptors, and will thus allow construction to proceed without significant adverse impacts.

In addition, the construction activities are temporary, the use of heavy equipment and noisy activities will be limited to daytime hours (Roseville 2003a, AFC § 8.7.2.2), and all industry-standard noise abatement measures will be implemented for noise-producing equipment.

Staff concludes that noise due to the REP's construction activities would have an insignificant adverse impact on the West Roseville neighborhoods.

## Linear Facilities

New off-site linear facilities would include an 800 foot sanitary wastewater discharge pipeline, a 50 foot tertiary treated recycled wastewater pipeline, a 60 kV transmission line, and approximately six miles of natural gas pipeline.

Construction of linear facilities typically moves along at a rapid pace, thus not subjecting any one receptor to noise impacts for more than two or three days. Further, the City's Noise Ordinance § 9.24.030 G (Roseville 2001) limits the hours of construction; see **NOISE Table 7**.

**NOISE Table 7**  
**Restriction of Construction Hours**

Day	Permissible Hours of Construction
Monday – Friday	7 a.m. to 7 p.m.
Saturday and Sunday	8 a.m. to 8 p.m.

Source: Roseville 2001

To ensure compliance with the remaining applicable restrictions, staff proposes Condition of Certification **NOISE-8**.

## Vibration

The only construction operation likely to produce vibration that could be perceived off-site would be pile driving. The applicant anticipates no pile driving will be required for construction of the REP (Roseville 2003a, AFC § 8.7.2.2); therefore, no vibration impacts are likely.

## Worker Effects

The applicant has acknowledged the need to protect construction workers from noise hazards, and has recognized those applicable LORS that would protect construction workers (Roseville 2003a, AFC Table 8.7-5; §§ 8.7.5.1, 8.7.5.2). To ensure that construction workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Certification **NOISE-3**.

## PROJECT SPECIFIC IMPACTS — OPERATION

### Community Effects

Power plant noise is unique. A power plant operates as, essentially, a steady, continuous noise source, unlike the intermittent sounds that comprise the majority of the noise environment. As such, power plant noise contributes to, and becomes part of, the background noise level, or the sound heard when most intermittent noises cease. Where power plant noise is audible, it will tend to define the background noise level. For this reason, staff compares the projected power plant noise to the existing ambient background ( $L_{90}$ ) noise levels at the affected sensitive receptors. If this comparison identifies a significant adverse impact, then feasible mitigation must be incorporated in the project to reduce or remove the impact.



In most cases, a power plant will be intended to operate around the clock for much of the year. Nighttime ambient noise levels are typically lower than the daytime levels; differences in background noise levels of 5 to 10 dBA are common. Staff believes it is prudent to average the lowest nighttime hourly background noise level values to arrive at a reasonable baseline for comparison with the project's projected noise level. This assumes the potential for annoyance due to power plant noise is greatest at night when residents are trying to sleep.

In addition, staff compares the projected project noise with applicable LORS, in this case, the City of Roseville General Plan and Noise Ordinance, and the Placer County Noise Ordinance.

### Power Plant Operation

During its operating life, the REP would essentially represent a steady, continuous noise source day and night. Occasional brief increases in noise levels would occur as steam relief valves open to vent pressure, or during startup or shutdown as the plant transitions to and from steady-state operation. At other times, such as when the plant would be shut down for lack of dispatch or for maintenance, noise levels would decrease.

The primary noise sources of the project include the gas turbine generators, the steam turbine generator, gas turbine air inlets, HRSG exhaust stacks, the natural gas fuel compressors, electrical transformers, and various pumps. The noise emanating from a power plant during normal operation is generally broadband, steady state in nature.

The applicant performed noise modeling to determine the project's noise impacts on currently existing sensitive receptors (Roseville 2003a, AFC Table 8.7-4). Calculations were based on typical manufacturer noise data for the major equipment (Roseville 2003a, AFC Appendix 8.7-A). These projections are shown in **NOISE Table 8**.

**NOISE Table 8**  
**Applicant's Plant Operational Noise Impacts (dBA)**

Receptor	Ambient Nighttime Background ( $L_{90}$ )	Projected Power Plant Noise Level ( $L_{eq}$ )	Increase over Ambient
5480 Phillip Road Residence	37.6	50.6	13
5490 Phillip Road Residence	35.6	50.0	14.4
4900 Phillip Road Residence	35.9	46.6	10.7

Source: Roseville 2003a, AFC Table 8.7-4

The applicant's ambient nighttime background values (see **NOISE Table 4**) were an average of all nine nighttime hours (Roseville 2003a, AFC Table 8.7-1). Inspection of the individual graphs of one-hour statistical measured sound levels (Roseville 2003a, AFC, Figures 8.7-6 through 8.7-9), however, shows that the background levels are relatively low for a period of four or five hours centered around 2 a.m., with increasing

levels before and after this time span. This is to be expected where late evening and early morning commute traffic influence the background noise. In such case, Energy Commission staff commonly averages background noise levels of the four quietest hours of the night, to exclude effects of commute traffic. With this adjustment figured in, staff's predicted operational noise impacts are summarized in **NOISE Table 9**.

**NOISE Table 9**  
**Staff's Plant Operational Noise Impacts (dBA)**

Receptor	4-hour Ambient Nighttime Background ( $L_{90}$ )	Projected Power Plant Noise Level ( $L_{eq}$ )	Resultant Noise Level ( $L_{eq}$ )	Increase over Ambient
5480 Phillip Road Residence	36.3	50.6	50.6	+14
5490 Phillip Road Residence	34.5	50.0	50.0	+15
4900 Phillip Road Residence	34.3	46.6	46.6	+12

Source: Roseville 2003a, AFC Table 8.7-1 and staff calculations

### Compliance with City Noise Element

The applicant has concluded that the City of Roseville General Plan standards (Noise Element) do not apply to the REP, because the only close residential receptors are rural/agricultural uses that are located outside of the City limits in unincorporated Placer County. In fact, the Noise Element will apply to project noise impacts on WRSP receptors. However, these limits are incorporated in the City Noise Ordinance (below).

### Compliance with City Noise Ordinance

The City's Noise Ordinance specifies that, where an industrially zoned area borders a residential area, the noise limits increase by 7 dBA over the General Plan requirements. That is, hourly  $L_{eq}$  level limits would be 57 dBA during the day and 52 dBA at night (Roseville 2001, § 9.24.120). (For a continuous, steady-state noise source such as a power plant, the  $L_{eq}$  and  $L_{90}$  values are comparable to each other). Based on the above projected power plant noise levels, it is seen that the power plant noise levels at the three sensitive receptors (ranging from 46.6 to 50.6 dBA nighttime  $L_{eq}$  (or  $L_{90}$ )), would be lower than the City of Roseville's Noise Ordinance requirement of 52 dBA, and thus in compliance with this ordinance.

### Compliance with Placer County Noise Ordinance

The County's Noise Ordinance contains guidelines that limit noise to a nighttime  $L_{eq}$  of 45 dBA (see **NOISE Table 3**). The applicant has concluded, and staff concurs, that the County General Plan standards are the LORS that are most applicable to the REP project, since the closest residential receptors are all within unincorporated Placer County. Based on the above projected power plant noise levels, it is seen that the power plant noise level at the three sensitive receptors would be 1.6 to 5.6 dBA higher

than Placer County's Noise Ordinance requirement. This violates the County's noise requirements and should be mitigated if feasible. Therefore, staff asks that the applicant identify feasible mitigation measures to lower the project noise level at the three existing residences to no more than 45 dBA. Should such mitigation prove infeasible, the applicant should request that the Energy Commission grant an override of this LORS.

To ensure that the plant would not exceed the projected noise levels shown in **NOISE Table 9** at the site boundary or at any sensitive receptor, staff has proposed Condition of Certification **NOISE-6**.

### **Compliance with CEQA**

As described above (under California Environmental Quality Act), staff considers it reasonable to assume that an increase in background noise levels of more than 10 dBA is clearly significant. The projected power plant noise levels will increase the existing ambient noise levels by 12 to 15 dBA at the three existing residences (see **NOISE Table 9**). Staff considers this increase significant and asks that the applicant identify feasible mitigation measures to lower the project background noise levels to comply with the CEQA requirements. If such mitigation should prove infeasible, the applicant should demonstrate this to staff.

### **Proposed West Roseville Specific Plan**

In response to staff's data request, the applicant performed noise modeling to estimate noise levels on the nearest planned WRSP residential areas to the west, northeast, east and southwest of the REP site (CH2MHill 2004a, DR #48). These projections are shown in **NOISE Table 10**.

These noise estimates are compared with predicted future noise levels, as indicated in the WRSP EIR, for roadways adjacent to or near these residential areas, to account for the cumulative increase in ambient noise from roadways and other sources that will be present in the future, when West Roseville is fully developed. The sound level due to the REP will be significantly lower than the predicted future (2020) traffic noise level at 100 feet from the roadway centerline adjacent to the nearest planned residential areas to the REP (See **NOISE Table 10**).

**NOISE Table 10**  
**Plant Operational Noise Impacts on**  
**Proposed WRSP Residential Development**

Type of Residential Use	Direction	Distance (feet)	REP Sound Level (L <sub>eq</sub> , dBA)	2020 Traffic Noise Level (L <sub>eq</sub> , dBA) <sup>1</sup>
High Density	West	1500	48	61 <sup>2</sup>
Low Density	Southwest	1725	47	61 <sup>2</sup>
Low Density	Northeast	1875	46	55 <sup>3</sup>
Low Density	East	2850	43	56 <sup>4</sup>

Source: REP 2004b, Table DR48-1

1. Source: Table 4.5-11, West Roseville Specific Plan and SOI Amendment Area EIR. L<sub>eq</sub> derived from L<sub>dn</sub> estimates at 100 feet from roadway centerline.

2. West Side, Pleasant Grove to Blue Oaks

3. Hayden, North of Blue Oaks

4. Hayden, South of Blue Oaks

Since the nearest WRSP receptors are more distant than the nearest existing residences that were modeled in the AFC (the nearest is 1,500 feet distant as compared to 1,115 feet), project noise impacts on WRSP receptors will be less than impacts on the nearest existing residences. Where current nighttime ambient noise levels at the nearest existing receptors are in the range of 34 to 36 dBA (**NOISE Table 9**, above), staff estimates that ambient levels in the WRSP neighborhoods will range around 40 dBA, a typical level for such development. The project-related noise level of 48 dBA (**NOISE Table 10**, above) would thus result in combined noise levels of 49 dBA, an increase of 9 dBA. While this may constitute a noticeable increase (i.e., residents could notice when the power plant is operating), staff believes that it will not be a source of annoyance.

The WRSP EIR includes several specific mitigation measures that require the project developer to demonstrate that residential noise levels will be consistent with City's standards. Specific recommendations include an acoustical study that addresses adequate setbacks, soundwalls/barriers and building orientation. In addition, residences in the Village Center that front roadways are required to implement many architectural and acoustic design measures (sound-rated windows, solid core doors, air conditioning, etc.). These design measures are estimated to provide up to 30 dB reduction from outside to inside levels (CH2MHill 2004a).

Additional noise attenuation will result from the erection of 6-foot-high masonry walls between the arterial and collector streets in West Roseville and the residential areas. Where these noise barriers break the line of sight between the REP and the receptor (for example, backyard of a residence shielded by a barrier), they can cause a noise reduction of 5 dBA. Intervening structures will also serve as noise barriers. For example, commercial or industrial buildings located west of the REP would likely block noise stemming from sources at the REP that are elevated, such as the air inlets. The first row of residences will also shield subsequent rows.

Therefore, staff concludes that noise levels from the REP, in combination with the expected WRSP noise levels, will result in an insignificant adverse impact on the future West Roseville Specific Plan residential neighborhoods.

### **Tonal and Intermittent Noises**

One possible source of annoyance would be strong tonal noises. Tonal noises are individual sounds (such as pure tones) that, while not louder than permissible levels, stand out in sound quality. Intermittent noises would include steam relief valves venting during startup, shutdown or unplanned unit trips. The applicant plans to address overall noise in design, and to install appropriate vent silencers to eliminate these factors as possible sources of annoyance (Roseville 2003a, AFC §§ 8.7.2.3, 8.7.4).

### **Linear Facilities**

All water and gas piping will lie underground, and will be silent during operation. Noise effects from the electrical interconnection line typically do not extend beyond the right-of-way easement of the line, and will thus be inaudible to any receptors.

### **Vibration**

Vibration from an operating power plant could be transmitted by two chief means; through the ground (groundborne vibration), and through the air (airborne vibration).

The operating components of a combined cycle power plant consist of high-speed gas and steam turbines, compressors, and various pumps. All of these pieces of equipment must be carefully balanced in order to operate and have permanent vibration sensors attached to the turbines and generators. The applicant states that it is unlikely that any vibration would be felt beyond 100 feet of so from the equipment. (Roseville 2003a, AFC § 8.7.2.3). Energy Commission staff agrees with this estimate, and agrees with the applicant that groundborne vibration from the REP will be undetectable by any likely receptor.

Airborne vibration (low frequency noise) can rattle windows and objects on shelves, and can rattle the walls of lightweight structures. The REP's chief source of airborne vibration would be the gas turbines' exhaust. In a combined cycle plant such as the REP, however, the exhaust must pass through the HRSGs and selective catalytic reduction (SCR) modules before it reaches the atmosphere. The HRSGs and SCRs act as extremely efficient silencers; it would be exceedingly rare for such a plant to cause perceptible airborne vibration effects.

### **Worker Effects**

The applicant has acknowledged the need to protect plant operating and maintenance workers from noise hazards, and has committed to comply with applicable LORS (Roseville 2003a, AFC §§ 8.7.5, 8.7.5.1, 8.7.5.2). Signs would be posted in areas of the plant with noise levels exceeding 85 dBA (the level that OSHA recognizes as a threat to workers' hearing), and hearing protection would be required. The applicant would also implement a comprehensive hearing conservation program. To ensure that plant operation and maintenance workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Certification **NOISE-7**.

## **CUMULATIVE IMPACTS**

Section 15130 of the CEQA Guidelines (Cal. Code Regs., tit. 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The CEQA Guidelines require that the discussion reflect the severity of the impacts and the likelihood of their occurrence, but need not provide as much detail as the discussion of the impacts attributable to the project alone.

Pursuant to CEQA, a cumulative impacts analysis can be performed by either 1) summarizing growth projections in an adopted general plan or in a prior certified environmental document, or 2) compiling a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this analysis.

One future project that staff is aware of that may have a direct cumulative impact on noise is the WRSP. The WRSP employs industrial and commercial areas, as well as recreational parks, as buffers between the REP and the existing and future noise-sensitive receptors (Roseville 2003a, AFC § 8.7.3). Project noise impacts on the WRSP are analyzed above.

The only other project that staff is aware of that may have a direct cumulative impact on noise is the PGWWTP. The PGWWTP to the south of the project site will be completed and operating before the REP construction begins. The applicant has described how noise levels from this facility (PGWWTP) are not expected to be significant at the three residences analyzed in this study, but they will raise the ambient noise level slightly. These higher ambient levels would help to mask noise from the REP (Roseville 2003a, AFC § 8.7.3).

Although the cumulative background noise levels in the project area will increase with the build-out of the West Roseville Specific Plan and operation of the PGWWTP, the noise levels will not increase beyond reasonably acceptable levels considered healthy and safe. Staff, therefore, agrees that no significant cumulative noise impacts are likely for the REP.

## **FACILITY CLOSURE**

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In the future, upon closure of the REP, all operational noise from the project would cease, and no further adverse noise impacts from operation of the REP would be possible. The remaining potential temporary noise source is the dismantling of the structures and equipment, and any site restoration work that may be performed. Since this noise would be similar to that caused by the original construction of the REP, it can be treated similarly. That is, noisy work could be performed during daytime hours, with machinery and equipment properly equipped with mufflers. Any noise LORS that were in existence at that time would apply. Applicable Conditions of Certification included in the Energy Commission Decision would also apply unless modified.

## CONCLUSIONS AND RECOMMENDATIONS

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At this time, Energy Commission staff cannot conclude that the REP can be built to comply with all applicable noise laws, ordinances, regulations and standards, and cause no significant adverse impacts under CEQA. In addition to the applicant's proposed mitigation measures, staff recommends that the applicant identify additional feasible noise mitigation measures that would allow the REP to comply with the Placer County Noise Ordinance and CEQA requirements (as described above). If such mitigation proves infeasible, the applicant should demonstrate this, and request that the Energy Commission grant an override of the Noise Ordinance.

Analysis further shows that there will be no significant cumulative impacts with another project, and no significant direct or cumulative noise impacts to an environmental justice population.

To ensure compliance with all applicable noise LORS and mitigation of noise impacts to less than significant levels, staff recommends adoption of the following Conditions of Certification.

## PROPOSED CONDITIONS OF CERTIFICATION

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**NOISE-1** At least 15 days prior to the start of ground disturbance, the project owner shall notify all residents within one-half mile of the site and the linear facilities, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

**Verification:** Prior to ground disturbance, the project owner shall transmit to the Compliance Project Manager (CPM) a statement, signed by the project owner's project manager, stating that the above notification has been performed, and describing the method of that notification, verifying that the telephone number has been established and posted at the site, and giving that telephone number.

## NOISE COMPLAINT PROCESS

**NOISE-2** Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project-related noise complaints. The project owner or authorized agent shall:

- Use the Noise Complaint Resolution Form (below), or a functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;

- Attempt to contact the person(s) making the noise complaint within 24 hours;
- Conduct an investigation to determine the source of noise related to the complaint;
- If the noise is project related, take all feasible measures to reduce the noise at its source; and
- Submit a report documenting the complaint and the actions taken. The report shall include: a complaint summary, including final results of noise reduction efforts; and if obtainable, a signed statement by the complainant stating that the noise problem is resolved to the complainant's satisfaction.

**Verification:** Within five days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form, with the local jurisdiction and the CPM, documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 3-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is implemented.

**NOISE-3** The project owner shall submit to the CPM for review and approval a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal-OSHA standards.

**Verification:** At least 30 days prior to the start of ground disturbance, the project owner shall submit to the CPM the noise control program. The project owner shall make the program available to Cal-OSHA upon request.

## **STEAM BLOW MANAGEMENT**

**NOISE-4** If a traditional, high-pressure steam blow process is employed, the project owner shall equip steam blow piping with a temporary silencer that quiets the noise of steam blows to no greater than 106 dBA measured at a distance of 50 feet. The project owner shall conduct steam blows only during the hours specified in Condition of Certification **NOISE-8**, unless the CPM agrees to longer hours based on a demonstration by the project owner that offsite noise impacts will not cause annoyance.

If a low-pressure continuous steam blow or air blow process is employed, the project owner shall submit a description of this process, with expected noise levels and projected hours of execution, to the CPM, who shall review the proposal with the objective of ensuring that the resulting noise levels from the steam or air blows alone will not exceed 53 dBA  $L_{eq}$  measured at the residence at 5480 Phillip Road. If the low-pressure process is approved by the CPM, the project owner shall implement it in accordance with the requirements of the CPM.

**Verification:** At least 15 days prior to the first high-pressure steam blow, the project owner shall submit to the CPM drawings or other information describing the temporary



steam blow silencer and the noise levels expected, and a description of the steam blow schedule.

At least 15 days prior to any low-pressure continuous steam blow, the project owner shall submit to the CPM drawings or other information describing the process, including the noise levels expected and the projected time schedule for execution of the process.

## **STEAM BLOW NOTIFICATION**

**NOISE-5** Prior to the first high-pressure steam blow(s), the project owner shall notify all residents, school principals or business owners within one mile of the site of the planned steam blow activity, and shall make the notification available to other area residents in an appropriate manner.

The notification may be in the form of letters to the area residences, telephone calls, fliers or other effective means. The notification shall include a description of the purpose and nature of the steam blow(s), the proposed schedule, the expected sound levels, and the explanation that it is a one-time operation and not a part of normal plant operations.

**Verification:** Project owner shall notify residents, schools and businesses at least 15 days prior to the first high-pressure steam blow(s). Within five days of notifying these entities, the project owner shall send a letter to the CPM confirming that the residents, schools and businesses have been notified of the planned steam blow activities, including a description of the method(s) of that notification.

## **NOISE RESTRICTIONS**

**NOISE-6** The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that operation of the project will not cause noise levels due to plant operation alone to exceed 45 dBA  $L_{eq}$  measured near the residence at 5480 Phillip Road (monitoring location 1), and that the noise due to plant operation will comply with the noise standards of the City of Roseville Noise Ordinance and the Placer County Noise Ordinance.

No new pure-tone components may be introduced. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints. Steam relief valves shall be adequately muffled to preclude noise that draws legitimate complaints.

- A. When the project first achieves a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey at the monitoring site at 5480 Philip Road. This survey during power plant operation shall also include measurement of one-third octave band sound pressure levels to ensure that no new pure-tone noise components have been introduced.
- B. If the results from the noise survey indicate that the power plant noise level ( $L_{eq}$ ) at the affected receptor exceeds the above value for any given

hour during the 25-hour period, or that the noise standards of the LORS have been exceeded, mitigation measures shall be implemented to reduce noise to a level of compliance with these limits.

- C. If the results from the noise survey indicate that pure tones are present, mitigation measures shall be implemented to eliminate the pure tones.

**Verification:** The survey shall take place within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity. Within 15 days after completing the survey, the project owner shall submit a summary report of the survey to the City of Roseville Planning Department, and to the CPM. Included in the survey report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. When these measures are in place, the project owner shall repeat the noise survey.

Within 15 days of completion of the new survey, the project owner shall submit to the CPM a summary report of the new noise survey, performed as described above and showing compliance with this condition.

**NOISE-7** Following the project first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility.

The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, sections 5095-5099 (Article 105) and Title 29, Code of Federal Regulations, section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure.

The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.

**Verification:** Within 30 days after completing the survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA and Cal-OSHA upon request.

## **CONSTRUCTION TIME RESTRICTIONS**

**NOISE-8** Heavy equipment operation and noisy construction work relating to any project features including high pressure steam blows shall be restricted to the times of day delineated below:

Monday through Friday	7 a.m. to 7 p.m.
Saturday and Sunday	8 a.m. to 8 p.m.

Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

**Verification:** Prior to ground disturbance, the project owner shall transmit to the CPM a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

## EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

Roseville Energy Park (03-AFC-1)		
<b>NOISE COMPLAINT LOG NUMBER</b> _____		
Complainant's name and address:  		
Phone number: _____		
Date complaint received: _____ Time complaint received: _____		
Nature of noise complaint:  		
Definition of problem after investigation by plant personnel:  		
Date complainant first contacted: _____		
Initial noise levels at 3 feet from noise source _____	dBA	Date: _____
Initial noise levels at complainant's property: _____	dBA	Date: _____
Final noise levels at 3 feet from noise source: _____	dBA	Date: _____
Final noise levels at complainant's property: _____	dBA	Date: _____
Description of corrective measures taken:  		
Complainant's signature: _____		Date: _____
Approximate installed cost of corrective measures: \$ _____		
Date installation completed: _____		
Date first letter sent to complainant: _____ (copy attached)		
Date final letter sent to complainant: _____ (copy attached)		
This information is certified to be correct:  		
Plant Manager's Signature: _____		

(Attach additional pages and supporting documentation, as required).



## REFERENCES

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CH2MHill, Sacramento, California (CH2MHill) 2004a. Applicant's Responses to CEC Staff Data Requests 1-71. Submitted to the Docket on February 6, 2004.

Placer (Placer County). 2004. Placer County Noise Ordinance, Noise, Section 9.36, dated January 6, 2004.

Roseville (City of Roseville). 2001. City of Roseville Noise Ordinance, Chapter 9.24 Noise Regulation, dated 2001.

Roseville (City of Roseville). 2003. City of Roseville General Plan, Noise Element, dated 2003.

Roseville (Roseville Electric). 2003a. Application for Certification for the Roseville Energy Park (03-AFC-1). Submitted to the California Energy Commission, October 30, 2003.

## NOISE APPENDIX A

### FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE

To describe noise environments and to assess impacts on noise sensitive area, a frequency weighting measure, which simulates human perception, is customarily used. It has been found that A-weighting of sound intensities best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. Decibels are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. **Noise Table A1** provides a description of technical terms related to noise.

Noise environments and consequences of human activities are usually well represented by an equivalent A-weighted sound level over a given time period ( $L_{eq}$ ), or by average day and night A-weighted sound levels with a nighttime weighting of 10 dBA ( $L_{dn}$ ). Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. Outdoor day-night sound levels vary over 50 dBA depending on the specific type of land use. Typical  $L_{dn}$  values might be 35 dBA for a wilderness area, 50 dBA for a small town or wooded residential area, 65 to 75 dBA for a major metropolis downtown (e.g., San Francisco), and 80 to 85 dBA near a freeway or airport. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be levels of noise adverse to public health.

Various environments can be characterized by noise levels that are generally considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than what would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding average daytime levels. The day-to-night difference in rural areas away from roads and other human activity can be considerably less. Areas with full-time human occupation that are subject to nighttime noise, which does not decrease relative to daytime levels, are often considered objectionable. Noise levels above 45 dBA at night can result in the onset of sleep interference effects. At 70 dBA, sleep interference effects become considerable (Effects of Noise on People, U.S. Environmental Protection Agency, December 31, 1971).

In order to help the reader understand the concept of noise in decibels (dBA), **Noise Table A2** has been provided to illustrate common noises and their associated sound levels, in dBA.

**Noise Table A1**  
**Definition of Some Technical Terms Related to Noise**

<b>Terms</b>	<b>Definitions</b>
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a Sound Level Meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this testimony are A-weighted.
L <sub>10</sub> , L <sub>50</sub> , & L <sub>90</sub>	The A-weighted noise levels that are exceeded 10%, 50%, and 90% of the time, respectively, during the measurement period. L <sub>90</sub> is generally taken as the background noise level.
Equivalent Noise Level, L <sub>eq</sub>	The energy average A-weighted noise level during the Noise Level measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 4.8 decibels to levels in the evening from 7 p.m. to 10 p.m., and after addition of 10 decibels to sound levels in the night between 10 p.m. and 7 a.m.
Day-Night Level, L <sub>dn</sub> or DNL	The Average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10 p.m. and 7 a.m.
Ambient Noise Level	The composite of noise from all sources, near and far. The normal or existing level of environmental noise at a given location.
Intrusive Noise	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.
Pure Tone	A pure tone is defined by the Model Community Noise Control Ordinance as existing if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the two contiguous bands by 5 decibels (dB) for center frequencies of 500 Hz and above, or by 8 dB for center frequencies between 160 Hz and 400 Hz, or by 15 dB for center frequencies less than or equal to 125 Hz.

Source: Guidelines for the Preparation and Content of Noise Elements of the General Plan, Model Community Noise Control Ordinance, California Department of Health Services 1976, 1977.



<b>Noise Table A2</b> <b>Typical Environmental and Industry Sound Levels</b>			
Noise Source (at distance)	A-Weighted Sound Level in Decibels (dBA)	Noise Environment	Subjective Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		Very Loud
Very Loud Music	110	Rock Music Concert	
Pile Driver (50')	100		
Ambulance Siren (100')	90	Boiler Room	
Freight Cars (50')	85		
Pneumatic Drill (50')	80	Printing Press Kitchen with Garbage Disposal Running	Loud
Freeway (100')	70		Moderately Loud
Vacuum Cleaner (100')	60	Data Processing Center Department Store/Office	
Light Traffic (100')	50	Private Business Office	
Large Transformer (200')	40		Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing

Source: Handbook of Noise Measurement, Arnold P.G. Peterson, 1980

## **Subjective Response to Noise**

The adverse effects of noise on people can be classified into three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction.
- Interference with activities such as speech, sleep, and learning.
- Physiological effects such as anxiety or hearing loss.

The sound levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants can experience noise effects in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction, primarily because of the wide variation in individual tolerance of noise.

One way to determine a person's subjective reaction to a new noise is to compare the level of the existing (background) noise, to which one has become accustomed, with the level of the new noise. In general, the more the level or the tonal variations of a new

noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual. With regard to increases in A-weighted noise levels, knowledge of the following relationships can be helpful in understanding the significance of human exposure to noise.

- 1 Except under special conditions, a change in sound level of one dB cannot be perceived.
- 2 Outside of the laboratory, a three dB change is considered a barely noticeable difference.
- 3 A change in level of at least five dB is required before any noticeable change in community response would be expected.
- 4 A ten dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response. (Kryter, Karl D., The Effects of Noise on Man, 1970)

### **Combination of Sound Levels**

People perceive both the level and frequency of sound in a non-linear way. A doubling of sound energy (for instance, from two identical automobiles passing simultaneously) creates a three dB increase (i.e., the resultant sound level is the sound level from a single passing automobile plus three dB). The rules for decibel addition used in community noise prediction are:

Noise Table A3 Addition of Decibel Values	
When two decibel values differ by:	Add the following amount to the larger value
0 to 1 dB	3 dB
2 to 3 dB	2 dB
4 to 9 dB	1 dB
10 dB or more	0
Figures in this table are accurate to $\pm 1$ dB.	

Source: Architectural Acoustics, M. David Egan, 1988

### **Sound and Distance**

Doubling the distance from a noise source reduces the sound pressure level by six dB.

Increasing the distance from a noise source 10 times reduces the sound pressure level by 20 dB.

### **Worker Protection**

OSHA noise regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time to which the worker is exposed:

**Noise Table A4**  
**OSHA Worker Noise Exposure Standards**

Duration of Noise (Hrs/day)	A-Weighted Noise Level (dBA)
8.0	90
6.0	92
4.0	95
3.0	97
2.0	100
1.5	102
1.0	105
0.5	110
0.25	115

Source: 29 C.F.R. § 1910.95

# PUBLIC HEALTH

Obed Odoemelam, Ph.D.

## INTRODUCTION

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The purpose of this Public Health analysis is to determine if toxic emissions from the proposed Roseville Energy Park (REP) would have the potential to cause significant adverse public health impacts or violate standards for public health protection in the project's impact area. If potentially significant health impacts are identified, staff will evaluate mitigation measures to reduce such impacts to insignificant levels.

Although staff addresses potential impacts of regulated or criteria air pollutants in the **Air Quality** section of this Preliminary Staff Assessment (PSA), **Attachment A** at the end of this section provides information on the health effects of such pollutants. Impacts on public and worker health from accidental releases of hazardous materials are examined in the **Hazardous Materials Management** section. Health effects from electric and magnetic fields are addressed in the **Transmission Line Safety and Nuisance** section. Pollutants released from the project in wastewater streams are discussed in the **Soils and Water Resources** section. Facility releases in the form of hazardous and non-hazardous wastes are addressed in the **Waste Management** section.

The following describes staff's method of analyzing potential health impacts and the criteria used to determine their significance.

## METHOD OF ANALYSIS

The **Public Health** analysis discusses toxic emissions to which the public could be exposed during project construction and routine operation. If toxic contaminants are released into the air or water, people may come into contact with them through inhalation, dermal contact, or ingestion via contaminated food or water.

Air pollutants for which no ambient air quality standards have been set are called non-criteria pollutants. Unlike criteria pollutants such as ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide, non-criteria pollutants have no ambient (outdoor) air quality standards that specify levels considered safe for everyone.

Since non-criteria pollutants do not have such standards, a process known as a health risk assessment is used to determine if people might be exposed to them at unhealthy levels. The risk assessment procedure consists of the following steps:

- Identification of the types and amounts of hazardous substances that a source could emit into the environment;
- Estimation of worst-case concentrations of project emissions into the environment using dispersion modeling;
- Estimation of the amounts of pollutants to which people could be exposed through inhalation, ingestion, and dermal contact; and

- Characterization of the potential health risks by comparing worst-case exposures to safe standards based on known health effects.

For REP and other sources, a screening level risk assessment is initially performed using simplified assumptions intentionally biased toward protection of public health. That is, an analysis is designed that overestimates public health impacts from exposure to the emissions. In reality, it is likely that the actual risks from the project will be much lower than the risks estimated by the screening level assessment. This overestimation is accomplished by identifying conditions that would lead to the highest, or worst-case risks, and then assuming them in the study. The process involves the following:

- using the highest levels of pollutants that could be emitted from the source;
- assuming weather conditions that would lead to the maximum ambient concentration of pollutants;
- using the type of air quality computer models which predict the greatest plausible impacts;
- calculating health risks at the location where the pollutant concentrations are estimated to be highest;
- using health-based standards designed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses); and
- assuming that an individual's exposure to cancer-causing agents would occur over a 70-year lifetime.

A screening level risk assessment will, at a minimum, include the potential health effects from inhaling hazardous substances. Some facilities may also emit certain substances, which could present a health hazard from non-inhalation pathways of exposure (see California Air Pollution Control Officers Association (CAPCOA) 1993, Table III-5). When these substances are present in facility emissions, the screening level analysis is conducted to include the following additional exposure pathways: soil ingestion, dermal exposure, and mother's milk (CAPCOA 1993, p. III-19).

The risk assessment process addresses three categories of health impacts: acute (short-term) health effects, chronic (long-term) non-cancer effects, and cancer risk (also long-term). Acute health effects result from short-term (one-hour) exposure to relatively high concentrations of pollutants. Acute effects are temporary in nature, and include symptoms such as irritation of the eyes, skin, and respiratory tract.

Chronic health effects are those, which arise as a result of long-term exposure to lower concentrations of pollutants. The exposure period is considered to be approximately from ten to one hundred percent of a lifetime (from seven to seventy years). Chronic health effects include diseases such as reduced lung function and heart disease.

The analysis for non-cancer health effects compares the maximum project contaminant levels to safe levels called "reference exposure levels" or RELs. These are amounts of toxic substances to which even sensitive people can be exposed and suffer no adverse health effects (CAPCOA 1993, p. III-36). This means that such exposure limits would

serve to protect such sensitive individuals as infants, the aged, and people suffering from illnesses or diseases which make them more susceptible to the effects of toxic substance exposure. The RELs are based on the most sensitive adverse health effects reported in the medical and toxicological literature, and include specific margins of safety, which address the uncertainties associated with inconclusive scientific and technical information available at the time of standard setting. They are, therefore, intended to provide a reasonable degree of protection against hazards that research has not yet identified. Each margin of safety is designed to prevent pollution levels that have been demonstrated to be harmful, as well as to prevent lower pollutant exposures that may pose an unacceptable risk of harm, even if the risk is not precisely identified as to nature or degree. Health protection can be expected if the estimated worst-case exposure is below the relevant reference exposure level. In such a case, an adequate margin of safety is assumed to exist between the predicted exposure and the estimated threshold for toxicity.

Exposure to multiple toxic substances may result in health effects that are equal to, less than, or greater than effects resulting from exposure to the individual chemicals. Only a small fraction of the thousands of potential combinations of chemicals have been tested for the health effects of combined exposures. In conformance with CAPCOA guidelines, the health risk assessment assumes that the effects of the individual substances are additive for a given organ system (CAPCOA 1993, p. III-37). In those cases where the actions may be synergistic (where the effects are greater than the sum), this approach may underestimate the health impact in question.

For carcinogenic substances, the health assessment considers the risk of developing cancer and conservatively includes the previously noted assumption that the individual would be continuously exposed over a 70-year lifetime. The risk that is calculated is not meant to project the actual expected incidence of cancer, but rather a theoretical upper-bound number based on worst-case assumptions.

Cancer risk is expressed in terms of chances per million of developing cancer and is a function of the maximum expected pollutant concentration, the probability that a particular pollutant will cause cancer (known as “potency factor”, and established by the California Office of Environmental Health Hazard Assessment), and the length of the exposure period. Cancer risks for individual carcinogens are added together to yield the total cancer risk from the source being considered. The conservative nature of the screening assumptions used means that actual cancer risks are likely to be considerably lower than those estimated.

The screening level analysis is performed to assess worst-case public health risk associated with the proposed project. If the screening analysis were to predict a risk of no significance, no further analysis would be necessary. However, if the risk were to be above the significance level, further analysis, using more realistic site-specific assumptions would be performed to obtain a more accurate estimate of the public health risk in question.

## **SIGNIFICANCE CRITERIA**

Commission staff estimates the health effects of exposure to toxic emissions based on impacts to the maximally exposed individual. This is a person hypothetically exposed to project emissions at a location where the highest ambient impacts were calculated using worst-case assumptions, as described above. As described earlier, non-criteria pollutants are evaluated for short-term (acute) and long-term (chronic) non-cancer health effects, as well as cancer (long-term) health effects. The potential significance of project health impacts is determined separately for each of the three categories of health effects.

### **Acute and Chronic Non-Cancer Health Effects**

Staff assesses the significance of non-cancer health effects by calculating a “hazard index” for the exposure being considered. A hazard index is a ratio obtained by comparing exposure from facility emissions to the reference (safe) exposure level for the toxicant. A ratio of less than one would signify a worst-case exposure below the safe level. The hazard indices for all toxic substances with the same types of health effect are added together to yield a total hazard index for the source being evaluated. This total hazard index is calculated separately for acute and chronic effects. A total hazard index less than one indicates that the cumulative worst-case exposure would be within safe levels. Under these conditions, health protection would be assumed even for sensitive members of the population. In such a case, staff would assume that there would be no significant non-cancer public health impacts from project operations.

### **Cancer Risk**

Staff relied upon regulations implementing the provisions of Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986 (Health & Safety Code, §§ 25249.5 et seq.) for guidance in establishing the level of significance for its assessed cancer risks. Title 22, California Code of Regulations, section 12703(b) states in this regard, that “the risk level which represents no significant risk shall be one which is calculated to result in one excess case of cancer in an exposed population of 100,000, assuming lifetime exposure.” This risk level is equivalent to a cancer risk of ten in one million, or  $10 \times 10^{-6}$ . An important distinction from the provisions in Proposition 65 is that the Proposition 65 significance level applies separately to each cancer-causing substance, whereas staff determines significance based on the total risk from all cancer-causing chemicals from the source in question. Thus, the manner in which the significance level is applied by staff is more conservative (health-protective) than with Proposition 65.

As noted earlier, the initial risk analysis for a project is normally performed at a screening level, which is designed to overstate actual risks, so that health protection can be ensured. When a screening analysis shows the cancer risks to be above the significance level, refined assumptions would likely result in a lower, more realistic risk estimate. If facility risk, based on refined assumptions, exceeds the significance level of ten in one million, staff would require appropriate measures to reduce risk to less than significant. If, after all risk reduction measures have been considered, a refined analysis still identifies a cancer risk of greater than ten in one million, staff would deem such risk to be significant, and would not recommend project approval.

## **LAWS ORDINANCES, REGULATIONS AND STANDARDS**

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The following Laws, Ordinances, Regulations and Standards (LORS) were established to protect against the impacts of the noted criteria pollutants and the air toxics-related impacts of specific concern in this analysis.

### **FEDERAL**

#### **The Clean Air Act of 1970 (42 U.S.C., section 7412)**

This section requires new sources, which emit more than 10 tons per year of air toxics or any combination of air toxics, to apply the Maximum Achievable Control Technology (MACT).

### **STATE**

#### **California Health and Safety Code section 41700**

This section of the code states that “no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause or have a natural tendency to cause injury or damage business or property.”

#### **California Health and Safety Code section 39650 et seq.**

This section of the code mandates that the California Environmental Protection Agency (Cal-EPA) establish safe exposure limits for toxic, non-criteria air pollutants, and identify the best available methods for controlling their emission. These laws also require that the new source review rules for each air district include regulations establishing procedures for controlling the emission of these pollutants. The toxic emissions from natural gas combustion are listed in the California Air Resources Board's (CARB's) Toxic Emissions Factors (CATEF) database for natural gas-fired combustion turbines to allow for uniform assessment as emitted from combustion and non-combustion sources in the state. Cal-EPA has developed specific cancer potency estimates for assessing any cancer risk that these air toxics may pose at specific exposure levels. For toxic air pollutants that do not cause cancer, Cal-EPA established the previously noted no-effects levels (also known as reference exposure levels or RELs) for assessing the likelihood of producing health effects at specific exposure levels. Such health effects would be considered significant only when exposure exceeds these reference levels. Staff uses these Cal-EPA potency estimates and reference exposure values in its health risk analyses.

#### **Health and Safety Code section 44300 et seq.**

This section of the code requires facilities, which emit large quantities of criteria pollutants, and any amount of non-criteria pollutants, to provide the local air district an inventory of toxic emissions. Operators of such facilities may also be required to prepare a quantitative health risk assessment to address the potential health risks



involved. The ARB ensures statewide implementation of these requirements through the state's air districts.

### **California Code of Regulations, Title 22, section 60306**

This section mandates that, whenever recycled water is used in an industrial cooling system involving the use of a cooling tower that creates a mist, disinfected tertiary recycled water shall be used. It also requires that when a cooling system uses recycled water in conjunction with a cooling tower that creates a mist that could come into contact with employees or members of the public, a drift eliminator and chlorine, or other biocide shall be used to treat the cooling system re-circulating water to minimize the growth of Legionella and other micro-organisms.

## **LOCAL**

### **Placer County Air Pollution Control District Rule 502**

This rule requires safe exposure limits for toxic and other air pollutants, use of Best Available Control Technology (BACT) and New Source Review (NSR).

## **SETTING**

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This section describes the environment in the vicinity of the proposed project site from the public health perspective. Features of the natural environment, such as meteorology and terrain, affect the project's potential for causing impacts on public health. An emission plume from a facility may affect elevated areas before lower terrain areas, due to a reduced opportunity for atmospheric mixing. Consequently, areas of elevated terrain can often be subjected to increased pollutant impacts. Also, the types of land use near a site influences population density and, therefore, the number of individuals potentially exposed to the project emissions. Additional factors affecting potential public health impacts include existing air quality and environmental site contamination.

## **SITE AND VICINITY DESCRIPTION**

According to the information from the applicant (Roseville 2003a, pp. 1-1, 6-, 8.1-1, 8.6-1 through 8.6-8, pp. 8.6-13, 8.6-14, and 8.9-1) the REP is proposed for a 12-acre site within a 40-acre land parcel owned by the City of Roseville. This parcel is located in southwest Placer County, approximately 5 miles northwest of downtown Roseville. The site is adjacent to and north of the Pleasant Grove Wastewater Plant and is surrounded by agricultural land, which is sparsely populated. The closest of the few nearby residences is located approximately 850 feet to the northwest. The site is generally flat with rolling hills and an average elevation of 95 feet above sea level.

The applicant (Roseville 2003a pp. 8.9-5 and 8.9-6, and Appendix 8.1-G) has provided a listing of the locations with sensitive receptors within a six-mile radius of the site. A sensitive receptor location, for purposes of a public health analysis, is an establishment that houses sensitive individuals such as children, the elderly, and individuals with respiratory diseases. The institutions in this case were identified as day-care facilities, convalescent homes, and schools. Since these individuals are more sensitive than the

average individual to the effects of environmental pollutants, their response is specifically considered in establishing the safe exposure limits for such pollutants, as noted earlier. However, staff holds all projects to the same health standards, whether proposed for a major population center, with many sensitive receptors, or a sparsely populated area with relatively few.

## **METEOROLOGY**

Meteorological conditions, including wind speed, wind direction, and atmospheric stability, affect the extent to which pollutants are dispersed into ambient air as well as the direction of pollutant transport. This, in turn, affects the level of public exposure to emitted pollutants and associated health risks. When wind speeds are low and the atmosphere is stable, for example, dispersion is reduced and localized exposure may be increased.

The climate at the project site is dominated by the influence of the Pacific Ocean and the Pacific high-pressure system, which is a semi-permanent, subtropical high-pressure system located off the coast. The size and strength of the Pacific High is at a maximum during the summer when it is at its northernmost position and results in strong northwesterly airflow and negligible precipitation. During this period, inversions become strong, winds blow lightly, and the pollution potential is high. The Pacific High's influence weakens during the fall and winter when it moves southwestward, which allows storms from the Gulf of Alaska to reach northern California. About 80 percent of the region's annual rainfall of about 12 inches occurs between November and March. During the winter months, inversions are weak, winds often moderate and the potential for air pollution is low.

Atmospheric stability is a measure related to turbulence, or the ability of the atmosphere to disperse pollutants due to convective air movement. Mixing heights (the height above ground level below which the air is well mixed and in which pollutants can be dispersed) are lower during the morning hours because of temperature inversions, which are followed by temperature increases in the warmer afternoons. Staff's **Air Quality** section presents a more detailed discussion of the area's meteorology.

## **EXISTING AIR QUALITY**

The proposed project site is within the jurisdiction of the Placer County Air Pollution Control District (PCAPCD). Using data on average concentrations of toxic pollutants measured at air monitoring sites, the health risk from existing pollutant exposures can be evaluated. For the toxic pollutants of specific concern in this analysis, the numerical cancer risk from such existing, or background exposures can be estimated. The nearest monitoring data to the proposed project area is on Hazelton Street in Stockton approximately 40 miles from the project site. Based on the measured 2000 levels, the California Air Resources Board (CARB 2002) estimated the theoretical air toxics-related inhalation-only cancer risk as approximately 185 in a million in the area. This risk estimate can be compared with the normal background lifetime cancer risk (from all cancer causes) of one in four, or 250,000 in a million, as will be noted later.

According to available information, the pollutants, 1,3-butadiene and benzene (emitted primarily from mobile sources) contribute the most to this air toxics-related background

risk, accounting together for over one half of the total. The risk from 1,3-butadiene by itself was estimated as 58 in a million, while the risk from benzene was about 54 in a million. Formaldehyde-related risk was estimated as 12 in a million, accounting for approximately 6.5 percent of the total. Formaldehyde is emitted directly from vehicles and other combustion sources such as the proposed REP.

The use of reformulated gasoline, beginning in the second quarter of 1996, as well as other toxics reduction measures, have led to a decrease in ambient levels of air toxics and associated cancer risk during the past few years. For example, at the noted Stockton, monitoring station, the related cancer risk was estimated as 376 in a million from 1991 measurement data and 212 in one million from 1996 data and 185 from 2000 data. The potential risk from REP and similar sources should best be assessed in the context of their potential addition to these background risk levels.

## IMPACTS

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### POTENTIAL IMPACTS OF PROJECT'S NON-CRITERIA POLLUTANTS

The health impacts of REP's non-criteria pollutants of specific concern in this analysis can be assessed separately as construction-phase impacts and operational-phase impacts.

#### **Construction Phase Impacts**

Possible construction-phase health impacts, as noted by the applicant (Roseville 2003a pp. 8.1-22, 8.1-40 and Appendix 8.1F), are those from human exposure to (a) the windblown dust from site excavation and grading, and (b) emissions from construction-related equipment. The dust-related impacts may derive from exposure to the dust itself as PM<sub>10</sub>, or exposure to any toxic contaminants that might be adsorbed on to it. Since, as more fully discussed in the **Waste Management** Section, the results from the Phase I and II Environmental Site Assessments for the proposed site (Roseville 2003a, pp. 8.14-1, 8.14-2 and Appendices 8.14-A, 8.14-B and 8.14C) did not identify any significant contamination, staff does not expect a significant health risk from soil-bound contaminants in the construction phase. The only soil-related construction impacts of potential significance would derive from the possible impacts of PM<sub>10</sub> as a criteria pollutant. As mentioned earlier, the potential for significant impacts from criteria pollutants is assessed in the **Air Quality** section.

The exhaust from diesel-fueled construction and other equipment has been established as a potent human carcinogen. Thus, construction-related emission levels should be regarded as possibly adding to the carcinogenic risk of specific concern in this analysis. Appendix 8.1-G (Roseville 2003a), presents the diesel emissions from the different types of equipment to be used in the construction phase. The maximum theoretical cancer risk from such diesel exhaust was calculated by the applicant as 5.2 in a million at the maximum impact location at the project fence line. Staff considers the recommended control measures (which are specified in **Air Quality** Condition of Certification AQ-SC3) as adequate to minimize the cancer risk during the relatively short (18- to 20-month) construction period for REP.

## **Operational Impacts**

The main health risk from REP operations would be associated with emissions from its two combustion turbines and heat recovery steam generators, duct burners, testing of the emergency power generator and fire pump, and evaporative cooling tower. In addition to the toxic substances emitted from the cooling tower, there is specific concern that bacterial growth in the cooling water could lead to potential health effects from human exposure. This is discussed below in the section on cooling tower operation and risk of Legionnaires' disease.

**Public Health Table 1** lists the project's toxic emissions and shows how each contributes to the risk estimated from the health risk analysis. For example, the first row shows that oral exposure to acetaldehyde is not of concern but, if inhaled, may have cancer and chronic (long-term) non-cancer health effects, but not acute (short-term) effects.

As noted in a publication by the South Coast Air Quality Management District (SCAQMD 2000, p. 6), one property that distinguishes the air toxics of concern in this analysis from the criteria pollutants is that the impacts from air toxics tend to be highest in close proximity to the source and quickly drop off with distance. This means that the levels of REP's air toxics would be highest in the immediate area and would decrease rapidly with distance. One purpose of this analysis, as previously noted, is to determine whether or not such exposures would be at levels of possible health significance as established using existing assessment methods.

The applicant's estimates of REP's potential contribution to the area's carcinogenic and non-carcinogenic pollutants were obtained from a screening-level health risk assessment conducted according to procedures specified in the 1993 California Air Pollution Control Officer's Association (CAPCOA) guidelines. The results from this assessment (summarized in staff's **Public Health Table 2**) were provided to staff along with documentation of the assumptions used (Roseville 2003a pp. 8.1-24 through 8.1-34, 8.9-1 through 8.9-15 and Appendices 8.1-C through 8.1-G). This documentation included:

- pollutants considered;
- emission levels assumed for the pollutants involved;
- dispersion modeling used to estimate potential exposure levels;
- exposure pathways considered;
- the cancer risk estimation process;
- hazard index calculation; and
- characterization of project-related risk estimates.

Staff has found these assumptions to be acceptable (with the exception of certain of the chronic Reference Exposure Levels which staff updated and used to adjust the chronic Hazard Index) and has validated the applicant's findings with regard to the numerical public health risk estimates expressed either in terms of the hazard index for each non-carcinogenic pollutant, or a cancer risk for estimated levels of the carcinogenic

pollutants. These analyses were conducted to establish the maximum potential for acute and chronic effects on body systems such as the liver, central nervous system, the immune system, kidneys, the reproductive system, the skin and the respiratory system.

**Public Health Table 1**  
**Types of Health Impacts and Exposure Routes Attributed to Toxic Emissions**

Substance	Oral Cancer	Oral Non-cancer	Inhalation Cancer	Non-cancer (Chronic)	Non-cancer (Acute)
Acetaldehyde			✓	✓	
Acrolein				✓	✓
Ammonia				✓	✓
Arsenic	✓	✓	✓	✓	✓
Benzene			✓	✓	✓
1,3-Butadiene			✓	✓	
Cadmium		✓	✓	✓	
Chromium			✓	✓	
Copper				✓	✓
Ethylbenzene				✓	
Formaldehyde			✓	✓	✓
Hexane				✓	
Lead	✓	✓	✓	✓	
Mercury		✓		✓	✓
Napthalene		✓		✓	
Nickel			✓	✓	✓
Polynuclear Aromatic Hydrocarbons (PAHs)	✓	✓	✓	✓	
Propylene				✓	
Propylene oxide			✓	✓	✓
Toluene				✓	✓
Xylene				✓	✓
Zinc				✓	

Source: Prepared by staff using reference exposure levels and cancer unit risks from CAPCOA Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993, SRP 1998, and Office of Environmental Health Hazard Assessment Air Toxics Hot Spots Program Risk Assessment Guidelines.

As shown in **Public Health Table 2**, the chronic hazard index for the maximally exposed individual is 0.023 while the maximum hazard index for acute effects is 0.048. These values are well below staff's significance criteria, suggesting that the pollutants in questions are unlikely to pose a significant risk of chronic or acute health effects anywhere in the project area.

**Public Health Table 2  
Operation Hazard/Risk**

Type of Hazard/Risk	Hazard Index/Risk	Significance Level	Significant?
<b>ACUTE NONCANCER</b>	0.048	1.0	No
<b>CHRONIC NONCANCER</b>	0.023	1.0	No
<b>INDIVIDUAL CANCER</b>	0.074x10 <sup>-6</sup> (a) 0.63x10 <sup>-6</sup> (b)	10.0 x 10 <sup>-6</sup>	No

Staff's summary of information from Roseville 2003a pp. 8.1-38 through 8.1-40, 8.9-9 through 8.9-11 and 8.6-59 through 8.6-8. and Appendix 8.1C through 8.1G.

(a) risk from normal project operations

(b) risk from diesel emergency generator testing

The cancer risk to the maximally exposed individual from normal project operation is shown as 0.074 in a million, which is well below staff's significance criterion for this screening level assessment. Thus, project-related cancer risk from routine operations would be insignificant for all individuals in the project area. Staff notes that the maximum risks from the assessed turbines and cooling towers occur at different locations, so adding these risk estimates together as done in this analysis further adds to the conservatism in the assessment process.

The highest project-related risk would be from exposure to the diesel exhaust from testing the project's emergency generator. Staff estimated this risk for the assumed testing period of 200 hours annually as 0.63 in a million. A similar risk for the fire pump was calculated as 0.02 in a million. As with routine operations, these risk estimates are well below staff's noted significance levels.

The conservatism in these assessments is further reflected in the fact that (a) the individual considered is assumed to be exposed at the highest possible levels to all the carcinogenic pollutants from the project for a 70-year lifetime, (b) all the carcinogens are assumed to be equally potent in humans and experimental animals, even when their cancer-inducing abilities have not been established in humans, and (c) humans are assumed to be as susceptible as the most sensitive experimental animal, despite knowledge that cancer potencies often differ between humans and experimental animals. Only a relatively few of the many environmental chemicals identified so far as capable of inducing cancer in animals have been shown to also cause cancer in humans.

### **Cooling Tower-Related Risk of Legionnaires' Disease**

Legionella is a bacterium that is ubiquitous in natural aquatic environments and is also widely distributed in man-made water systems. It is the principal cause of legionellosis, otherwise known as Legionnaires' disease, which is similar to pneumonia. Transmission to people results mainly from inhalation or aspiration of aerosolized contaminated water. Untreated or inadequately treated cooling systems, such as industrial cooling towers and building heating, ventilating, and air conditioning systems, have been correlated with outbreaks of legionellosis, since cooling water systems and their components can amplify and disseminate aerosols containing Legionella.

The State of California regulates recycled water that is used for cooling towers operations according to requirements in Title 22, Section 60303, California Code of Regulations. These requirements mandate the use of chlorine or other biocides to an extent necessary to minimize the growth of *Legionella* and other microorganisms.

*Legionella* can grow symbiotically with other bacteria and can infect protozoan hosts. This provides *Legionella* with protection from adverse environmental conditions, including making it more resistant to water treatment with chlorine, biocides, and other disinfectants. Staff notes that most water treatment programs are designed to minimize scale, corrosion, and biofouling, and not necessarily to control *Legionella*.

Effective mitigation measures should include a cleaning and maintenance program to minimize the accumulation of bacteria, algae, and protozoa that may contribute to nutritional needs of *Legionella*. The American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE 1998) emphasizes the need for such programs in its specifications for Legionellosis prevention. Also, the Cooling Tower Institute has issued Guidelines for the Best Practices for Control of *Legionella* (CTI 2000). Preventive maintenance includes having effective drift eliminators, periodically cleaning the system as appropriate, maintaining mechanical components in working order, and maintaining an effective water treatment program with appropriate biocide concentrations.

Staff's recommended Condition of Certification **Public Health-1** is intended to ensure the effective maintenance and bactericidal action necessary during the operation of REP's cooling tower. This condition would specifically require the project owner to prepare and implement a cooling water management plan to ensure that bacterial growth is kept to a minimum in the cooling tower. With the use of an aggressive antibacterial program, coupled with routine monitoring and biofilm removal, the chances of *Legionella* growth and dispersal would be reduced to insignificance.

## **CUMULATIVE IMPACTS**

As previously noted, the maximum impact location would be the spot where pollutant concentrations for the proposed REP would theoretically be highest. Even at this location, staff does not expect any significant change in lifetime risk to any person, given the calculated incremental cancer risk of 0.074 in one million, which staff regards as not potentially contributing significantly to the previously noted average lifetime individual cancer risk of 250,000 in one million. Modeled facility-related residential risks are much lower for more distant locations. Given the previously noted conservatism in the utilized calculation method, the actual risks would likely be much smaller. Therefore, staff does not consider the incremental risk estimate for REP's operation as pointing to a potentially significant contribution to the area's cancer risk.

The worst-case long-term non-cancer health impact from the project (represented as a chronic hazard index of 0.023) is well below staff's significance level of 1.0 at the location of maximum impact. At this level, staff does not expect any cumulative health impacts to be significant. As with cancer risk, long-term hazard would be lower at all other locations and cumulative impacts at other locations would also be less than significant.

## COMPLIANCE WITH LORS

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Since the cancer and non-cancer risks from REP operation reflect the effectiveness of proposed control measures (including an oxidation catalyst which reduces hazardous air pollutant emissions) proposed by the applicant or required by the applicable LORS, staff concludes that the proposed operational plan would comply with these LORS.

## FACILITY CLOSURE

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As noted in the introduction section, the toxic pollutants of primary concern in this analysis are those from routine operation of the proposed project. During temporary or permanent closure, the main concern would be over the non-routine releases of hazardous materials or wastes on site. Such releases are discussed respectively in the **Hazardous Materials** and **Waste Management** sections of this PSA. During temporary closure (periods greater than those required for normal maintenance), it is unlikely that there would be any routine releases of harmful substances to the environment, since the facility would not be operating. During permanent closure, the only emissions of potential significance would derive from demolition or dismantling activities and the equipment used. Such emissions would be subject to controls according to requirements in conditions adopted by the Energy Commission after a closure plan is received from the project owner.

## CONCLUSIONS AND RECOMMENDATIONS

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Staff has determined that the toxic air emissions from the construction and operation of the proposed natural gas-burning REP are at levels that do not require mitigation beyond that already proposed by the applicant. The conditions for ensuring compliance with all applicable air quality standards are specified in the **Air Quality** section for the area's problem criteria pollutants. Implementation of staff's proposed condition of certification to reduce the likelihood of Legionella growth would ensure that the risk of Legionella growth and dispersion is reduced to levels of insignificance.

If the proposed project is approved, staff recommends the following Condition of Certification to address the risk from Legionella in the cooling tower.

## PROPOSED CONDITION OF CERTIFICATION

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**Public Health-1** The project owner shall develop and implement a Cooling Water Management Plan to ensure that the potential for bacterial growth in cooling water is kept to a minimum. The Plan shall be consistent with either Staff guidelines for the control of bacteria in cooling water or with the Cooling Technology Institute's "Best Practices for Control of Legionella" guidelines.

**Verification:** At least 30 days prior to the commencement of cooling tower operations, the Cooling Water Management Plan shall be provided to the CPM for review and approval.



## REFERENCES

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## **ATTACHMENT A - CRITERIA POLLUTANTS**

### **OZONE (O<sub>3</sub>)**

Ozone is not directly emitted from specific sources but is formed when reactive organic compounds (VOCs) interact with nitrogen oxides in the presence of sunlight. Heat speeds up the reaction, typically leading to higher concentrations in the relatively hot summer months. Ozone is a colorless, reactive gas with oxidative properties that allow for tissue damage in the exposed individual. The effects of such damage could be experienced as respiratory irritation that could interfere with normal respiratory function. Ozone can also damage plants and other materials susceptible to oxidative damage.

The U.S. EPA revised its federal ozone standard on July 18, 1997 (62 Fed. Reg. 38856), based on health studies that had become available since the standard was last revised in 1979. These new studies showed that adverse health effects could occur at ambient concentrations much lower than reflected in the previous standard, which was based on acute health effects experienced during heavy exercise. In proposing the new standard, the EPA identified specific health effects known to have been caused by short-term exposures (of one to three hours) and prolonged exposure (of six to eight hours) (61 Fed. Reg. 65719). However, a 1999 federal court ruling blocked implementation of the ozone 8-hour standard, which is yet to be implemented.

Acute health effects from short-term exposures include a transient reduction in pulmonary function, and transient respiratory symptoms including cough, throat irritation, chest pain, nausea, and shortness of breath with associated effects on exercise performance. Other health effects of short-term or prolonged O<sub>3</sub> exposures include increased airway responsiveness (which predisposes the individual to bronchoconstriction induced by external stimuli such as pollen and dust), susceptibility to respiratory infection (through impairment of lung defense mechanisms), increased hospital admissions and emergency room visits, and transient pulmonary inflammation.

Generally, groups considered especially sensitive to the effects of air pollution include persons with existing respiratory diseases, children, pregnant women, and the elderly. However, controlled exposure data on people in clinical settings have indicated that the population at greatest risk of acute effects from ozone exposures as children and adults engaged in physical exercise. Children are most at risk because they are active outside, playing and exercising, during summer when ozone levels are highest. Adults who are outdoors and engaging in heavy exertion in the summer months are also among the individuals most at risk. This happens because such exertion increases the amount of O<sub>3</sub> entering the airways and can cause O<sub>3</sub> to penetrate to peripheral regions of the lung where lung tissue is more likely to be damaged. These individuals, as well as those with respiratory illnesses, such as asthma, can experience a reduction in lung function and increased respiratory symptoms, such as chest pain and cough, when exposed to relatively low ozone levels during periods of moderate exertion.

## **CARBON MONOXIDE (CO)**

Carbon monoxide is a colorless, odorless gas, which is a product of inefficient combustion. It does not persist in the atmosphere, being quickly converted to carbon dioxide. However, it can reach high levels in localized areas, or "hot spots".

CO reduces the oxygen carrying capacity of the blood, thereby disrupting the delivery of oxygen to the body's organs and tissues. Persons sensitive to the effects of carbon monoxide include those whose oxygen supply or delivery is already compromised. Thus, groups potentially at risk to carbon monoxide exposure include persons with coronary artery disease, congestive heart failure, obstructive lung disease, vascular disease, and anemia, the elderly, newborn infants, and fetuses (CARB 1989, p. 9). In particular, people with coronary artery disease were found to be especially at risk from carbon monoxide exposure (CARB 1989, p. 9). Tests conducted on patients with confirmed coronary artery disease indicated that exposure to low levels of carbon monoxide during exercise can produce significant cardiac effects. These effects include chest pain (angina) and electrocardiographic changes indicative of effects on the heart muscle (CARB 1989, p. 6). Such changes can limit the ability of patients with coronary artery disease to exert themselves even moderately. Therefore, the statewide carbon monoxide one-hour and eight-hour standards were adopted in part to prevent aggravation of chest pain. Additionally, however, the standards are intended to prevent decreased exercise tolerance in persons with peripheral vascular disease and lung disease, impaired central nervous system functions, and effects on the fetus (Cal. Code Regs. Tit. 17, sec. 70200).

## **PARTICULATE MATTER (PM)**

Particulate matter is a generic term for particles of various substances, which occur as either liquid droplets or small solids of a wide range of sizes. Particles with the most potential to adversely affect human health are those less than 10 micrometers (millionths of a meter) in diameter (known as PM<sub>10</sub>), which may be inhaled and deposited within the deep portions of the lung (PM<sub>10</sub>). PM may originate from anthropogenic or natural sources such as stationary or mobile combustion sources or windblown dust. Particles may be emitted directly to the atmosphere or result from the physical and chemical transformation of gaseous emissions such as sulfur oxides, nitrogen oxides, and volatile organic compounds. PM<sub>10</sub> may be made up of elements such as carbon, lead, and nickel; compounds such as nitrates, organics, and sulfates; and complex mixtures such as diesel exhaust and soil fragments. The size, chemical composition, and concentration of ambient PM<sub>10</sub> can vary considerably from area to area and from season to season within the same area.

PM<sub>10</sub> can be grouped into two general sizes of particles, fine and coarse, which differ in formation mechanisms, chemical composition, sources, and potential health effects. Fine-mode particles are those with a diameter of 2.5 micrometers or less (PM<sub>2.5</sub>), while the coarse-mode fraction of PM consists of particles ranging from 10 micrometers down to 2.5 micrometers in diameter.

Coarse-mode PM<sub>10</sub> is formed by crushing, grinding, and abrasion of surfaces, and in the course of reducing large pieces of materials to smaller pieces. Coarse particles consist mainly of soil dust containing oxides of silicon, aluminum, calcium, and iron; as

well as fly ash, particles from tires, pollen, spores, and plant and insect fragments. Coarse particles normally have shorter lifetimes (minutes to hours) and only travel over short distances (of less than tens of kilometers). They tend to be unevenly distributed across urban areas and have more localized effects than the finer particles.

PM<sub>2.5</sub> is derived both from combustion by-products, which have volatilized and condensed to form primary PM<sub>2.5</sub>, and from precursor gases reacting in the atmosphere to form secondary PM<sub>2.5</sub>. Components include nitrates, organic compounds, sulfates, ammonium compounds, and trace elements (including metals) as well as elemental carbon such as soot. Major sources of PM<sub>2.5</sub> are fossil fuel combustion by electric utilities, industry and motor vehicles, vegetation burning, and the smelting or other processing of metals. Dry deposition of fine mode particles is slow allowing such particles to often exist for long periods of time (of from days to weeks) in the atmosphere and travel hundreds to thousands of kilometers. They tend to be uniformly distributed over urban areas and larger regions and are removed from the atmosphere primarily by forming cloud droplets and falling out within raindrops.

The health effects of PM<sub>10</sub> from any given source usually depend on the toxicity of its constituent pollutants. The size of the inhaled material usually determines where it is deposited in the respiratory system. Coarse particles are deposited most readily in the nose and throat area while the finer particles are more likely to be deposited within the bronchial tubes and air sacs, with the greatest percentage deposited in the air sacs. Until recently, PM<sub>10</sub> particles had been considered to be the major fraction of airborne particulates responsible for various adverse health effects. The PM<sub>10</sub> fraction is known to be capable of penetrating the thoracic and alveolar regions of the human and animal lungs. The PM<sub>2.5</sub> fraction, however, was found to pose a significantly higher risk for health. This is due to their size and associated deposition and retention characteristics in the respiratory tract, enabling it to penetrate and deposit within the deeper alveolar regions of the lung. The following aspects of PM<sub>2.5</sub> deposition all contribute to the more serious health effects attributed to smaller particles:

- The deposition of PM<sub>2.5</sub> favors the periphery of the lungs, which is especially vulnerable to injury for anatomical reasons.
- Clearance of the PM<sub>2.5</sub> from within the deeper reaches of the lungs is a much slower process than from the upper regions. Consequently, the residence time is longer, implying longer exposure, and hence greater risk.
- The human anatomy further allows the penetration of the superficial tissues by PM<sub>2.5</sub> and entry into the bodily circulation without much effort in the periphery of the lungs.

Many epidemiological studies have shown exposure to particulate matter capable of inducing a variety of health effects, including premature death, aggravation of respiratory and cardiovascular disease, changes in lung function and increases in existing respiratory symptoms, effects on lung tissue structure, and impacts on the body's respiratory defense mechanisms. The underlying biological mechanisms are still poorly understood. Based on their review of a number of these epidemiological studies (as published after 1987 when the federal standards were revised), together with suggestion of PM<sub>2.5</sub> concentrations as a more reliable surrogate for the health impacts

of the finer fraction of PM than PM<sub>10</sub>, the U.S. EPA concluded that the then-current standards were not sufficiently stringent to protect against significant effects in exposed humans. Therefore, federal PM standards were revised on July 18, 1997 (62 Fed. Reg. 38652) to add new annual and 24-hour PM<sub>2.5</sub> standards to the existing annual and 24-hour PM<sub>10</sub> standards. Taken together, these new standards were meant to provide additional protection against a wide range of PM-related health effects, including premature death, increased hospital admissions and emergency room visits, primarily among sensitive individuals such as the elderly, children and individuals with cardiopulmonary diseases such as asthma. Other impacts include decreased lung function (particularly in children and asthmatics), and alterations in lung tissue and structure.

California has also had 24-hour and annual standards for PM<sub>10</sub> (CARB 1982, pp. 81, 84). These studies were aimed at establishing the PM<sub>10</sub> levels capable of inducing asthma, premature death and bronchitis-related symptoms. They were set to protect against such impacts in the general population as well as sensitive individuals such as patients with respiratory disease, declines in pulmonary function, especially as related to children (Tit. 17, Cal. Code Regs. §70200). These standards were set to be more stringent than the federal standard, which the ARB regarded as inadequate for the protection desired (CARB 1991, p. 26).

On June 20, 2002, the ARB approved the adoption of a lower annual state standard for PM<sub>10</sub>, as well as a new annual standard for PM<sub>2.5</sub> (CARB 2002). The new standards took effect on July 5, 2003. The 24-hour PM<sub>10</sub> standard was not changed. The standards were established to prevent excess death, illnesses such as respiratory symptoms, bronchitis, asthma exacerbation, and cardiac disease, and restrictions in activity from short- and long-term exposures (Title 17, Cal. Code Regs. §70200).

## **NITROGEN DIOXIDE (NO<sub>2</sub>)**

Nitrogen dioxide is formed either directly or indirectly when oxygen and nitrogen in the air combine together during the combustion. It is a relatively insoluble gas, which can penetrate deep into the lungs, its principal site of toxicity. Its toxicity is thought to be due to its capacity to initiate free radical-mediated reactions while oxidizing cellular proteins and other biomolecules (CARB 1992, Appendix A, p. 4).

Sub lethal exposures in animals usually produce inflammations and varying degrees of tissue injury characteristic of oxidant damage (Evans in CARB 1992, Appendix A, and p. 5). The changes produced by low-level acute or sub chronic exposures appear to be reversible when the animal study subject is allowed to recover in clean air.

Health effects of particular concern in relation to low-level nitrogen dioxide exposure include: (1) effects of acute exposure on some asthmatics and possibly on some persons with chronic bronchitis, (2) effects on respiratory tract defenses against infection, (3) effects on the immune system, (4) initiation or facilitation of the development of chronic lung disease, and (5) interaction with other pollutants (CARB 1992, Appendix A, p. 5).

Several groups, which may be especially susceptible to nitrogen dioxide-related health effects have been identified from human studies (CARB 1992, Appendix A, and p. 3).

These include asthmatics, persons with chronic bronchitis, infants and young children, cystic fibrosis and cancer patients, people with immune deficiencies, and the elderly.

Studies involving brief, controlled exposures on sensitive individuals have shown an increase in bronchial reactivity or airway responsiveness of some asthmatics, as well as decreased lung function in some patients with chronic obstructive lung disease (CARB 1992, Appendix A, p. 2). In general, bronchial hyper reactivity (an increased tendency of the airways to constrict) is markedly greater in asthmatics than in non-asthmatics upon exposure to initiating respiratory irritants (CARB 1992a, p. 107). At exposure concentrations of specific relevance to the current one-hour ambient standard, there appears to be little, if any, effect on respiratory symptoms of asthmatics (CARB 1992a, p. 108).

### **SULFUR DIOXIDE (SO<sub>2</sub>)**

Sulfur dioxide is formed when any sulfur-containing fuel is burned. SO<sub>2</sub> is highly soluble and consequently absorbed in the moist passages of the upper respiratory system. Exposure to sulfur dioxide can lead to changes in lung cell structure and function that adversely affect a major lung defense mechanism known as muco-ciliary transport. This mechanism functions by trapping particles in mucus in the lung and sweeping them out via the cilia (fine hair-like structures) also in the lung. Slowed mucociliary transport is frequently associated with chronic bronchitis.

Exposure to sulfur dioxide can produce both short- and long-term health effects. Therefore, California has established sulfur dioxide standards to reflect both short- and long-term exposure concerns. Based on controlled exposure studies of human volunteers, investigators have found that asthmatics comprise the group most susceptible to adverse health effects from exposure to sulfur dioxide (CARB 1994, p. V-1).

The primary short-term effect is bronchoconstriction, a narrowing of the airways, which results in labored breathing, wheezing, and coughing. The short-term (one-hour) standard is based on bronchoconstriction and associated symptoms (such as wheezing and shortness of breath) in asthmatics and is designed to protect against adverse effects from five to ten minute exposures. In the opinion of the California Office of Environmental Health Hazard Assessment, the short-term ambient standard is likely to afford adequate protection to asthmatics engaged in short periods of vigorous activity (CARB 1994, Appendix A, p. 16).

Longer-term exposure is associated with increased incidence of respiratory symptoms (such as coughing and wheezing) or respiratory disease, decreases in pulmonary function, and an increased risk of premature mortality (CARB 1991a, p. 12). The long-term (24-hour) standard is based upon increased incidence of respiratory disease and premature mortality. The standard includes a margin of safety based on epidemiological studies, which have shown adverse respiratory effects at levels slightly above the standard. Some of the studies indicate a sulfur dioxide threshold for effects, suggesting that no significant effects are expected from exposures to concentrations at the state standard (Ibid.).

## ATTACHMENT A - REFERENCES

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# **SOCIOECONOMICS**

Joseph Diamond, Ph.D.

## **INTRODUCTION**

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This California Energy Commission (Energy Commission) staff socioeconomic impact analysis evaluates the project induced changes on community services and/or infrastructure and related community issues such as environmental justice and facility closure. Direct, indirect, induced, and cumulative impacts are also included. Staff discusses the estimated impacts of the construction and operation of the Roseville Energy Park (REP) project on local communities, community resources, and public services, pursuant to Title 14, California Code of Regulations, Section 15131. The REP project power plant and transmission line will be owned, and operated by Roseville Electric (RE), a department of the City of Roseville and a public agency, while the natural gas pipeline will be owned, and operated by PG&E.

## **LAWS, ORDINANCES, REGULATIONS AND STANDARDS**

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California Government Code, section 65996-65997 places levies against development projects near school districts. As amended by SB 50 (Stats. 1998, ch. 407, Sec. 23), public agencies may not impose fees, charges or other financial requirements to offset the cost for school facilities.

## **ENVIRONMENTAL SETTING**

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The REP is located in the City of Roseville in Placer County, approximately 5 miles northwest of Roseville's city center. The REP site is owned by the City of Roseville. The affected area as defined by the REP project in the AFC and by staff is the greater Sacramento Area which includes El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba Counties.<sup>1</sup> Sacramento and Placer Counties, and their major cities Sacramento and Roseville, are within a one-hour one-way commute distance of the power plant site, an area in which construction and operations workers may live. The applicant and staff utilized the Sacramento County and the Golden Sierra Consortium (Alpine, El Dorado, Nevada, Placer, and Sierra Counties), and North Central Consortium (Colusa, Glenn, Lake, Sutter, and Yuba Counties) labor market areas for its evaluation of construction and operation worker availability and community services and infrastructure impacts from construction and operation. Placer County was used as the study area in identifying non-fiscal (private sector) benefits from the REP.

## **ANALYSIS AND IMPACTS**

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Staff reviewed the REP AFC, Vol. I, Socioeconomic section and socioeconomic data adequacy responses (ROSEVILLE 2003a). Based on staff's use of the socioeconomic

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<sup>1</sup> Most of the environmental and economic impacts identified are based on using Placer County as the study area because it is most likely to be impacted by the project. However, the economic impact analysis, which used IMPLAN, an input-output model explained later in this section, was done for Placer and Sacramento Counties due to the high economic interdependence. Staff accepts this rationale.



data provided and referenced from governmental agencies, trade associations and staff's independent analysis, staff agrees with the applicant's socioeconomic analysis and conclusions.

This staff analysis uses fixed percentage criteria for housing and environmental justice in evaluating potential impacts. For housing, staff uses a vacancy rate of five percent or less of permanent available housing, and for environmental justice, staff uses a threshold of greater than 50 percent for minority/low-income population in the affected area. Criteria for subject areas such as fire protection, water supply and wastewater disposal are analyzed in other sections of this staff assessment. Educational impacts are subjectively determined but are moot, as described later. Impacts on medical services, law enforcement, or community cohesion are based on subjective judgements or input from local and state agencies. Typically, substantial non-local employment has the potential to result in significant impacts to the study area.

## **EMPLOYMENT AND ECONOMY**

According to the REP AFC and its Data Adequacy Supplement, most (an estimated 90 percent) pertinent crafts workers will come from within a one hour commuting distance (approximately 50 miles) to the REP project, though the remaining 10 percent could draw on the Golden Sierra Consortium or the North Central Consortium (ROSEVILLE 2003a and b).

The average commute time is defined as distances that involve up to a one-hour, one-way commute for construction and operations employees. However, construction workers generally commute as much as two hours (one-way). This defines the local labor market. Construction workers who live in communities at greater distances than a two-hour, one-way commute tend to relocate to the project area for the work week, then return home on the weekend. Operations workers tend to live within a one-hour, one-way commute, and if they live outside this area they would likely relocate. The "non-local" workers for the REP project will represent a small percentage for operations. Non-technical positions will be filled from the local workforce (Placer County) while the regional labor will supply the more technical positions (ROSEVILLEa).

The following **Socioeconomics Table 1** shows that available labor, by skill, in Sacramento County and The Golden Sierra Consortium is considerable when compared to the REP project needs.

**SOCIOECONOMICS Table 1**  
**Available Labor by Skill for Construction and Operations\***

<b>Occupational Title</b>	<b>Annual Averages</b> <b>1999</b> <b>2006</b> <b>(Estimated)</b>		<b>Maximum (Monthly)</b> <b>Number Of Construction</b> <b>Workers Needed For The</b> <b>Project (includes power</b> <b>plant, recycled water</b> <b>pipeline, natural gas</b> <b>pipeline, and</b> <b>transmission lines)</b>
Masons	560	740	5
Carpenters	7,600	10,840	12
Painters	2,010	2,620	4
Iron Workers, Structural Metal Workers	330	510	20
Electricians	3,400	4,560	30
Welders and Cutters	870	1,130	N/A
Boilermakers	N/A	N/A	20
Truck Drivers	12,930	17,020	2
Operating Engineers	830	1,110	8
Helpers, Laborers	29,060	38,010	15
Pipe fitters/plumbers/steam fitters	2,320	2,960	56
Mechanical Engineers (including technicians)	1,150	1,190	N/A
Electrical and Electronic Engineers (including technicians)	5,020	7,010	N/A
Insulation Workers	310	380	10
Millwrights	280	250	15
Sheet Metal Workers	1,980	2,900	10
Architects and Surveyors (including surveyor technicians)	1,340	1,640	N/A
Supervisors (Construction)	2,400	3,260	N/A

Source: ROSEVILLE 2003a.

\* The labor pool here includes Sacramento County, the Golden Sierra Consortium, and the North Central Consortium. No data are available from the Roseville Energy Park AFC for insulation workers and architects and surveyors (including technicians) for the North Central Consortium.

Placer County has a fairly large workforce of 144,000 for California as of January 2004 (State of California 2004). The peak construction activity for the REP project represents less than 1 percent of the Placer County January 2004 workforce.

The Impact Analysis For Planning (IMPLAN) model (an input-output model), used by the applicant to estimate employment impacts from the REP project on the study area, is widely used and acceptable to staff. The University of California at Berkeley uses the IMPLAN model for regional economic assessment, and it has been used to assess other generating projects in California and the U.S. It is a common regional economic

tool. In general, most multipliers are estimated by showing the total change divided by the initial change. Employment multipliers refer to the total additional employment stimulated by the new economic activity. IMPLAN is a disaggregated type of model that divides the (regional) economy into sectors and provides a multiplier for each sector (Lewis et al. 1979). Social Accounting Matrix (SAM)<sup>2</sup> multipliers were used for the applicant's economic impact analysis. SAM multipliers are similar to Type II<sup>3</sup> multipliers because they both include the indirect and induced effects (secondary impacts). An IMPLAN SAM variety employment multiplier of 1.9 for the base case was used for construction (e.g., the 114 new construction job's income supports approximately 99 indirect and induced jobs in the regional economy for a total of 213 jobs)<sup>4</sup>. An IMPLAN SAM variety employment multiplier of 2.1 was used for operations indicating that the 25 direct jobs support approximately 27 indirect and induced jobs in the regional economy, resulting in a total of 52 jobs. An IMPLAN SAM variety construction income multiplier of 1.2 for the base case was used that resulted in a secondary impact of \$3,204,000 and a total impact of \$16,467,000. Finally, an IMPLAN SAM variety operation income multiplier of 1.3 was used that resulted in a secondary impact of \$1,111,000 and a total impact of \$5,111,000 (CH2MHill 2004h).<sup>5</sup> These multipliers are within an acceptable range of 2 to 2.5 over the long run often cited by many economists (Moss et al. 1994). Therefore, staff considers these projected beneficial economic impacts to be reasonable.

Project construction (power generation including the natural gas pipeline, recycled wastewater pipeline, and electric power transmission) is expected to occur over a 19 month period. The greatest number of construction workers (peak), estimated to be 206 workers will be needed in the 11<sup>th</sup> and 12<sup>th</sup> month of construction. The number of construction workers will range from 50 in the first few and last few months of construction to approximately 206 workers in the 11 and 12<sup>th</sup> month of construction. These workers will come mainly from the local area.

The preliminary unemployment rate for Placer County was 5.0 percent in January 2004, not seasonally adjusted. This is close to full employment. For California, the unemployment rate was 6.7 percent (State of California 2004).

Staff accepts the applicant's estimate that the non-local construction workforce (approximately 10 percent of the total construction workforce or 11) would come from weekly commuters from within the greater Sacramento area or from the Golden Sierra Consortium or North Central Coast (ROSEVILLE 2003b). It is unlikely that the workers would bring their families due to the seasonal nature of the work.

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<sup>2</sup> Type SAM multipliers capture inter-institutional transfers and account for social security and income tax leakages, institutional savings, and commuting.

<sup>3</sup> A Type I multiplier is the ratio of the direct plus indirect change to the direct change resulting from a unit increase in final demand for any given sector. A Type II multiplier is the ratio of the direct, indirect, and induced change to the direct change resulting from a unit increase in final demand. The Type II multiplier takes into account the repercussionary effects of secondary rounds of consumer spending in addition to the direct and indirect interindustry effects (Richardson 1972). Both multipliers can be of an income or employment type.

<sup>4</sup> Based on \$13.26 million in local construction expenditures.

<sup>5</sup> All project construction and operations economic estimates are presented in 2006 and 2003 dollars respectively (CH2MHill 20004i and j). Staff is working with the applicant on acquiring more accurate data in a single year for the FSA.

During operation of the project, about 25 workers will be needed to maintain and operate the project. Most of the 25 operational workers are expected to come from Placer County, with most of the rest coming from the greater Sacramento area. Staff agrees with the applicant that a small increase in employment will have little effect on employment rates.

## **POPULATION**

The 2000 U.S. Census shows California with a total population of 33,871,648, minority population of 18,054,858 (53.3 percent), and a white (non-Hispanic) population of 15,816,790 or (46.7 percent). For Placer County, 2000 Census shows a total population of 248,399, minority 41,163 (16.6 percent), and a white population of (non-Hispanic) 207,231 or 83.4 percent. The population of Roseville was 79,924 in 2000, minority 16,184 (20.2 percent), and a white population of 63,737 (79.8 percent). By 2010, California will grow to 40,262,400, Placer County 336,805, and the City of Roseville 110,793 (ROSEVILLE 2003a). As mentioned under the **Employment** section, the majority of construction and operation labor will be local so there would be little induced population growth from the REP project. During construction, individual work assignments typically last from several days to weeks which suggest there will be no permanent relocation of construction workers. Furthermore, there would be no displacement of population by the REP project.

## **HOUSING**

According to federal standards, permanent housing is considered to be in short supply if the vacancy rate is less than five percent (URS 2000). As of January 1, 2000, there were approximately 107,302 housing units in Placer County and an additional 31,925 housing units in the City of Roseville (see Table 8.10-2 of the AFC). The vacancy rate for this housing averages approximately 13 percent for Placer County and 3.6 percent for the City of Roseville. There are about nine hotels/motels with 1,112 rooms in the City of Roseville with an average vacancy rate of 11 percent (ROSEVILLE 2003b). The housing units available to non-local construction workers for this project are sufficient for worker needs. The majority of the construction workforce, and most of the operations work force, is expected to be drawn from the local labor force. Also, non-local construction workers typically stay in hotel/motels.

The REP project will not result in the displacement of housing.

## **FISCAL**

The REP project capital costs are from \$100 to \$130 million. The estimated value of materials and supplies that will be purchased locally (within Placer County) during construction is between \$1.5 and \$3 million. Sales tax is paid on material and supply expenditures. The sales tax rate of 7.25 percent in Placer County is comprised of the state sales tax rate (six percent), one percent to the place of sale, 0.25 percent to the county and 0.125 percent to special districts. The total sales tax estimated during construction is between \$109,000 and \$218,000.

The construction payroll is \$30 million. The total payroll for the operation phase is estimated to be \$1.45 million annually. In addition, there are local expenditures of \$450,000 per year on materials and supplies during operation. The estimated annual

sales tax during operation at 7.25 percent times the cost of purchasing locally purchased materials would be approximately \$32,625 (ROSEVILLE 2003b). RE is a public agency and will not pay property taxes.

## **SCHOOLS**

There are three public elementary school districts (22 elementary schools) and one high school district within the City of Roseville. Overall, four school districts operate in the City of Roseville. RE, as a municipal utility, is a public agency exempt from paying school impact fees as required by California Government Code section 65996-65997.

The average pupil-teacher ratio for all schools within the City of Roseville was 20.8:1 during the 2002-2003 school year. This ratio was similar to the Placer County and California pupil-teacher ratios, which were 20.5:1 and 20.7:1 respectively (California Department of Education 2003). Overcrowding does not appear to exist in the City of Roseville schools.

Staff agrees with the applicant that most non-local construction workers (10 percent or 21 workers for the peak and 11 workers for the average) will probably not bring their families for the 19-month project. During the operations phase, even if all of the 25 operating employees were to relocate and live in Roseville, which is not likely to be the case, it would not result in a significant adverse impact. Assuming an average family size of 3.03 (US 2000 Census) about 25 children would be added to the local schools. This would result in a less than one-percent increase in enrollment for the base year of 2002-2003 for the City of Roseville. Overall, staff expects no significant impact on study area schools.

Education Code section 17620 states that public agencies may not impose fees, charges or other financial requirements to offset the cost for “school facilities.” School facilities are defined as “any school-related consideration relating to a school district’s ability to accommodate enrollment.” Local and state agencies are precluded from imposing (additional) fees or other required payments on development projects for the purpose of mitigating possible enrollment impacts to schools.

## **POLICE PROTECTION**

The AFC (Section 8.10.1.5 Law Enforcement) notes that the proposed REP project will be served by the Roseville Police Department. The Roseville Department has 95 sworn officers and 68.5 support personnel. The response time to an emergency at the proposed project site is approximately five to six minutes (ROSEVILLE 2004a). The Placer County Sheriff’s office also provides law enforcement in the City of Roseville. The REP project would not significantly increase the existing demand for police service or adversely affect police protection in and around the REP project area (CEC 2004a). There would be a small increase in population during the 19 months of construction and during operation, but most of the workforce will be local (ROSEVILLE 2003a).

## **MEDICAL SERVICES/UTILITIES**

In the AFC (Section 8.10.1.5 Public Services), medical services are discussed. The Sutter Roseville Medical Center in Roseville is the closest medical facility to the proposed site. It is approximately 9 miles from the REP project with a response time of

approximately 20 minutes. The Sutter Roseville Medical Center has 172 licensed beds and more than 400 staff physicians. It is the only trauma center between Sacramento and Reno and operates a 24-hour emergency department.

Water and wastewater discharge is discussed in a separate Preliminary Staff Assessment (PSA) section entitled **Soil and Water Resources**. The REP project will connect to RE's electrical transmission lines and PG&E will deliver natural gas. Adequate supplies of electricity are available for REP's construction, and gas is available for REP's operation (CEC 2003a) which is discussed in the PSA **Reliability** section. Fire protection is discussed in the PSA section entitled **Worker Safety and Fire Protection**. Solid waste removal is discussed in the PSA section entitled **Waste Management**.

Finally, the REP project will not directly or indirectly induce substantial population growth. Hence, there are no significant socioeconomic impacts that might trigger adverse physical impacts in the provision of public services

## **CUMULATIVE IMPACTS**

Cumulative impacts might occur when more than one project has an overlapping construction schedule that creates a demand for workers that can not be met by local labor, resulting in an influx of non-local workers and their dependents.

A major mixed-use planned development, referred to as the West Roseville Specific Plan (WRSP), is close to the REP project and will impact over 3,000 acres. Economic conditions will influence the pace of economic development for the WRSP. The REP project will start up in spring 2005 so there is some potential overlap. The skills set for these projects differ, with the WRSP, a residential/commercial development, and the REP an industrial facility. The WRSP will involve less demand for pipe fitters, electricians, boilermakers, iron workers, laborers, millwrights and carpenters than REP. However, WRSP would involve demand for electricians and carpenters.

There is another power plant being constructed within the REP project area. This is the Sacramento Municipal Utility Cosumnes Power Plant (CPP). Phase 1 of CPP began 24 months of construction in October 2003. Again, REP construction will be for 19 months beginning in early 2005.

Table 2 shows expected workforce requirements with nine overlapping months. Work on CPP (Phase 1) looks to be coming to a close as work begins on the REP project. Also, the projects are 34 miles apart at opposite ends of the Sacramento metropolitan area, hence drawing on somewhat different labor pools. Overall, this should diminish the competition for power plant work force (ROSEVILLE 2003b).

**Table 2 Construction Workforce for CPP (Phase 1) and REP Showing Overlap**

Months of Overlap	1/05	2/05	3/05	4/05	5/05	6/05	7/05	8/05	9/05
Cosumnes (Phase I) Construction Month (started in 2003)	16	17	18	19	20	21	22	23	24
CPP (Phase I) Total Construction Workforce	286	286	233	233	173	143	80	28	18
REP Construction Month	1	2	3	4	5	6	7	8	9
REP Total Construction Workforce	50	50	50	150	150	150	150	150	150
CPP and REP Total Construction Workforce	336	336	283	383	323	293	230	178	168

Source: ROSEVILLE 2003b.

Finally, because the REP project would not result in any significant adverse socioeconomic impacts to population, housing, or public services due to the small size and temporary nature of construction, it is unlikely that it would contribute significantly to cumulative socioeconomic impacts. Staff concludes that there are no significant adverse cumulative socioeconomic impacts.

## **MINORITY AND LOW-INCOME POPULATIONS (ENVIRONMENTAL JUSTICE SCREENING ANALYSIS)**

The purpose of the environmental justice screening analysis is to determine whether a low-income and/or minority population exists within the potentially affected area of the proposed site. Staff conducted the screening analysis in accordance with the "Final Guidance for Incorporating Environmental Justice Concerns in [the Environmental Protection Agencies'] EPA's [National Environmental Policy Act] NEPA Compliance Analysis," Guidance Document (EPA 1998). Minority populations, as defined by this Guidance Document, are identified where either:

- the minority population of the affected area is greater than fifty percent of the affected area's general population; or
- the minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis; or

- one or more census blocks in the affected area have a minority population greater than fifty percent.

In 1997, the President's Council on Environmental Quality issued Environmental Justice Guidance that defines minority as individuals who are members of the following population groups: American Indian or Alaskan Native, Asian or Pacific Islander; Black not of Hispanic origin; or Hispanic. Low-income populations are identified with the annual statistical poverty thresholds from the Bureau of the Census's Current Population Reports, Series P-60 on Income and Poverty (OMB 1978).

Staff has reviewed Census 2000 information that shows minority population by census block is 28.75 percent, which is less than staff's threshold of fifty percent within a six-mile radius of the proposed REP project (See **Socioeconomics Figure 1**). But, there are pockets (census blocks) with greater than 50 percent minority population. Census 2000 by census block group information shows that the low-income population is 5.22 percent within the same radius. Poverty status excludes institutionalized people, people in military quarters, people in college dormitories, and unrelated individuals under 15 years old.

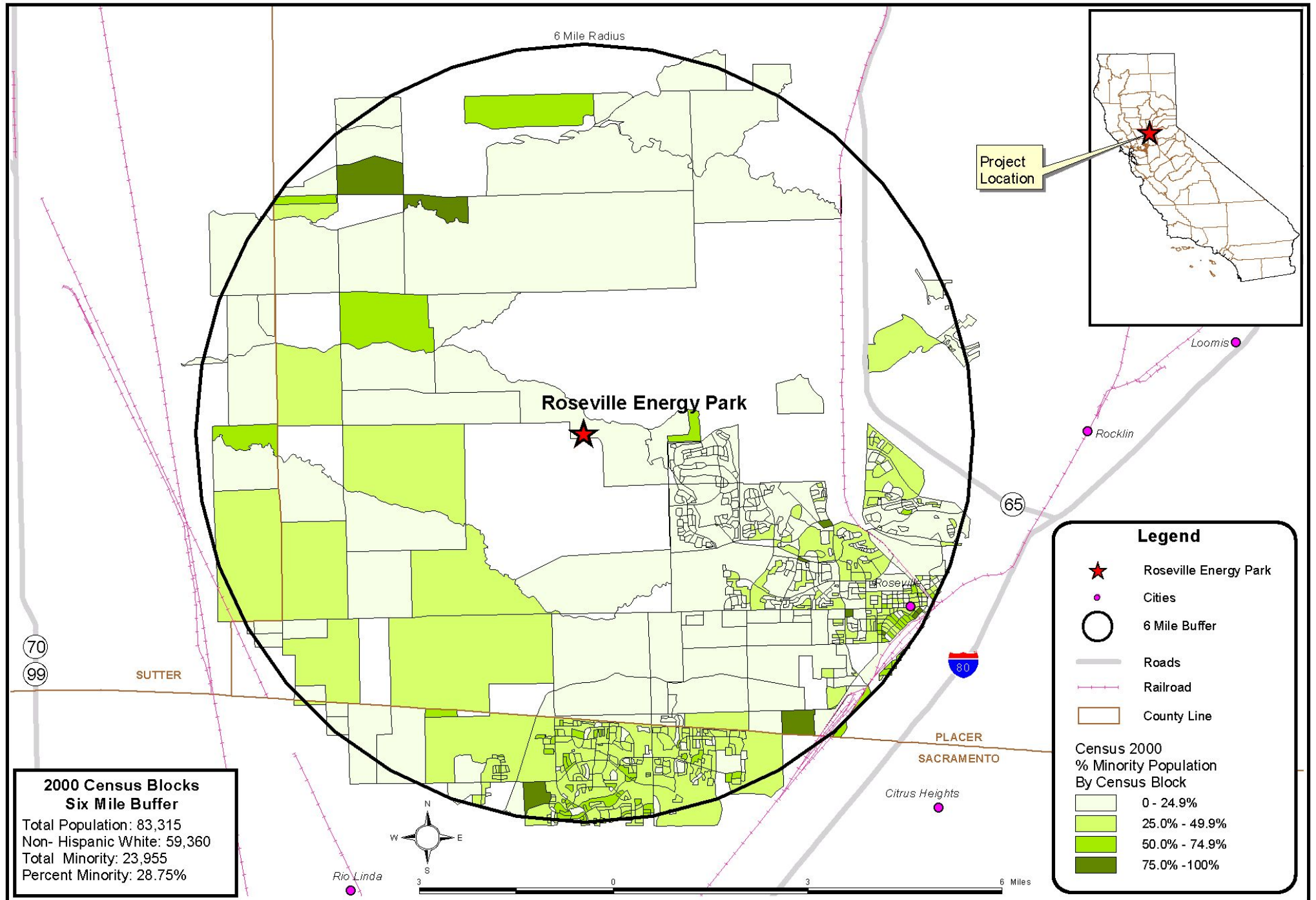
Based on this socioeconomic analysis, staff has not identified significant direct or cumulative, adverse socioeconomic impacts resulting from the construction or operation of the project. The REP project is proposed to be built in an urban area, will not physically alter the community, and will largely utilize a local labor force that will not create any new significant demands on community infrastructure and services. Therefore, there are no socioeconomic environmental justice issues related to this project.

For a listing of other technical sections that include an EJ analysis, please refer to the **Introduction** section of this document. For a summary of environmental justice impacts regarding these other sections, please see the **Executive Summary**.



# **SOCIOECONOMICS - FIGURE 1**

Roseville Energy Park - Census 2000 Minority Population by Census Block - Six Mile Buffer



## **FACILITY CLOSURE**

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The REP AFC did not include in socioeconomics Laws, Ordinances, Regulations and Standards (LORS) that will be incorporated into the facility closure plan when it becomes necessary at the end of the project's economic life. The socioeconomic impacts of facility closure will be evaluated at that time. The planned lifetime of the proposed power plant is 30 years.

Any unexpected, temporary closure would not likely cause any significant environmental impacts on the affected area, because the likely result of a temporary closure would be reactivation of the power plant by the same or a new owner within a relative short period of time. Personnel changes may occur if there is an ownership change, but socioeconomic impacts would not change significantly because the number of operation personnel would remain relatively the same.

Any unexpected, permanent closure of the REP would not likely cause any significant adverse socioeconomic impacts on the affected area, because facility closure impacts (i.e., dismantling) would be similar to construction impacts, and staff has found no significant adverse socioeconomic impacts due to the construction of the project. However, a facility closure plan would be analyzed to determine if there would be any socioeconomic impacts.

## **MITIGATION**

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Since staff has not identified any significant adverse socioeconomic impacts, no mitigation measures are proposed.

## **CONCLUSIONS AND RECOMMENDATIONS**

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### **CONCLUSIONS**

There are estimated gross benefits from the REP project which include increases in sales taxes, employment, and income for Placer and Sacramento Counties. For example, there are estimated to be 114 direct project-related construction jobs for 18-20 months of construction, resulting in 213 total jobs that will be created, of which 99 are secondary (indirect and induced) jobs. Secondary construction income impacts are estimated at \$3,204,000 with the total \$16,467,000. For operations, 25 direct jobs will be created with 27 secondary (indirect and induced) jobs for a total of 52 jobs. Secondary operation income impacts are estimated at \$1,111,000 with a total of \$5,111,000. The total sales tax during construction is estimated to be \$109,000 to \$218,000.

Staff finds that the REP project will not cause a significant adverse socioeconomic impact on the study area's housing, schools, police, emergency services, hospitals, and utilities. Based on staff's demographic screening analysis, the minority population and low-income population within six miles of the proposed power plant site is less than 50

percent, but there are individual census blocks with greater than 50 percent minority population. Staff finds that there would be no significant adverse socioeconomic impacts since most of the construction and operation workforce is within the regional or local labor market area and construction activities are short-term. Staff has determined that there would be no significant adverse direct or cumulative socioeconomic impacts and, therefore, there are no socioeconomic environmental justice issues.

The REP project, as proposed, is consistent with the applicable socioeconomic LORS.

## **RECOMMENDATIONS**

Staff does not propose any socioeconomic conditions of certification.

**Socioeconomics Table 3** provides a summary of socioeconomic data and information from this analysis, with emphasis on economic benefits of the REP project.

<b>SOCIOECONOMIC DATA AND INFORMATION - TABLE 3<sup>6</sup></b>	
Project Capital Costs	\$100-\$130 million
Estimate of Locally Purchased Materials	
Construction	\$1.5-\$3 million
Operation	\$450,000 per year
Estimated Annual Property Taxes	Not applicable. Roseville Electric (RE) is a public agency.
Estimated School Impact Fees	RE is exempt.
Direct Employment	
Construction (average)	114 jobs
Operation	25 jobs
Secondary Employment	
Construction	99 jobs
Operation	27 jobs
Direct Income	
Construction	\$13,263,000
Operation	\$4,000,000
Secondary Income	
Construction	\$3,204,000
Operation	\$1,111,000
Payroll	
Construction	Total-\$30 million.
Operation	Average: \$1.45 million annually.
Estimated Sales Taxes	
Construction	\$109,000 to \$218,000
Operation	\$32,625 annually.
Existing /Projected Unemployment Rates	Existing – 5 percent in January 2004, not seasonally adjusted for Placer County and 6.7 percent in January 2004, not seasonally adjusted for California. Projected - Not available.
Percent Minority Population (6 mile radius)	28.75 percent
Percent Poverty Population (6 mile radius)	5.22 percent

## REFERENCES

EPA (U. S. Environmental Protection Agency). 1998. Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis. April, 1998.

<sup>6</sup> Table 3 uses 2003 dollars for operations and 2006 dollars for construction. See footnote 5 for a complete discussion. Construction is for 19 months, and project life planned for 30 years. Economic (non-fiscal and fiscal) impacts, unemployment, and population information are generally for Placer County. However, the results of IMPLAN/Input-Output modeling are for Placer and Sacramento Counties and show secondary, indirect and induced impacts, as well as direct impacts.

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# SOIL & WATER RESOURCES

Richard Latteri

## INTRODUCTION

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This section analyzes the potential effects on soil and water resources by the Roseville Energy Park (REP) as proposed by Roseville Electric (RE or applicant). The analysis specifically focuses on the potential for REP to:

- cause accelerated wind or water erosion and sedimentation;
- exacerbate flood conditions in the vicinity of the project;
- adversely affect surface or groundwater supplies;
- degrade surface or groundwater quality; and
- comply with all applicable laws, ordinances, regulations and standards (LORS).

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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### FEDERAL

#### **Clean Water Act**

The Clean Water Act (CWA) (33 U.S.C. Section 1251 et seq.) was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non point source discharges to surface water. Those discharges are regulated by the National Pollutant Discharge Elimination System (NPDES). In California, NPDES permitting authority is delegated to, and administered by, the nine Regional Water Quality Control Boards (RWQCBs).

Section 401 of the Clean Water Act requires that any activity that may result in a discharge into a water body must be certified by the RWQCB so that the proposed activity will not violate state and federal water quality standards.

Section 404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers (ACOE) to regulate the discharge of dredged or fill material to the waters of the U.S. and adjacent wetlands. The ACOE issues site specific or general (Nationwide) permits for such discharges.

#### **Resource Conservation and Recovery Act**

The Resource Conservation Recovery Act (RCRA) of 1976 (42 U.S.C. Section 6901 et seq.) is designed to prevent surface and groundwater contamination, sets guidelines for determining hazardous wastes, and identifies proper methods for handling and disposing of those wastes.

## **STATE**

### **Porter Cologne Water Quality Control Act**

The Porter Cologne Water Quality Control Act of 1967, Water Code Section 13000 et seq., requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. Those criteria include the identification of beneficial uses, narrative and numerical water quality standards, and implementation procedures. Water quality criteria for the project area are contained in the Water Quality Control Plan, Fourth Edition, for the Sacramento River and San Joaquin river Basins. This plan sets numerical and/or narrative water quality standards controlling the discharge of wastes to the state's waters and land. Those standards are applied to the proposed project through the Waste Discharge Requirements permit.

### **California Water Code**

Water Code section 13550 requires the use of reclaimed water where available, as determined by the SWRCB. The availability of reclaimed water is based upon a number of criteria, which include provisions that the quality and quantity of the reclaimed water are suitable for the use, the cost is reasonable, the use is not detrimental to public health, and will not impact downstream users or biological resources.

Section 13551 of the Water Code prohibits the use of "...water from any source of quality suitable for potable domestic use for non potable uses, including ...industrial... uses, if suitable reclaimed water is available..." given conditions set forth in Section 13550. Those conditions take into account the quality and cost of the water, the potential for public health impacts and the effects on downstream water rights, beneficial uses and biological resources.

Section 13552.6 of the Water Code specifically identifies that the use of potable domestic water for cooling towers, if suitable reclaimed water is available, is an unreasonable use of water. The availability of reclaimed water is based upon a number of criteria that must be taken into account by the SWRCB. Those criteria are that the quality and quantity of the reclaimed water are suitable for the use, the cost is reasonable, and the use is not detrimental to public health, will not impact downstream users or biological resources, and will not degrade water quality.

Section 13552.8 of the Water Code states that any public agency may require the use of reclaimed water in cooling towers if certain criteria are met, as determined by the SWRCB. Those criteria include that reclaimed water is available and meets the requirements set forth in section 13550; the use does not adversely affect any existing water right; and if there is public exposure to cooling tower mist using reclaimed water, appropriate mitigation or control is necessary.

### **Recycling Act of 1991**

The California Legislature's Water Recycling Act of 1991 (Water Code § 13575 et seq.) makes several findings and declarations regarding California's water resources and the need to develop reliable water sources. The Act encourages the use of recycled water

for certain uses and established standards for the development and implementation of recycled water programs.

### **California Code of Regulations**

Under Title 22 of the California Code of Regulations, the California Department of Health Services (DHS) reviews and approves wastewater treatment systems to ensure they meet tertiary treatment standards allowing use of reclaimed water for industrial processes such as steam production and cooling water.

Title 17 of the California Code of Regulations addresses the requirements for backflow prevention and cross connections of potable and non potable water lines.

### **The California Safe Drinking Water and Toxic Enforcement Act**

This Act (California Health & Safety Code Section 25249.5 et seq.) prohibits actions contaminating drinking water with chemicals known to cause cancer or possessing reproductive toxicity. The requirements of the Act are administered by the RWCQB.

## **STATE POLICIES**

### **State Water Resources Control Board**

The SWRCB has adopted policies that provide guidelines for water quality protection. The principal policy of the SWRCB that specifically addresses the siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling (adopted as Resolution 75-58 on June 19, 1975). This policy states that fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound.

State Water Resources Control Board Resolution 77-1 encourages and promotes reclaimed water use for non potable purposes.

## **LOCAL**

### **City of Roseville Municipal Code**

Section 14.17 – Recycle Water Policy requires recycled water to be used in a manner that is in compliance with all LORS, and in lieu of portable water where feasible.

Section 14.26 -- Industrial Wastewater regulates discharges to the City's sanitary wastewater system.

## **ENVIRONMENTAL SETTING**

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### **SITE AND VICINITY DESCRIPTION**

The proposed REP site is located approximately six miles from the center of the City of Roseville, Placer County, California. The City of Roseville is located at the southern



edge of Placer County and is bounded on the north and west by unincorporated lands, on the south by Sacramento County, and on the east by the unincorporated community of Granite Bay. The City of Sacramento is located approximately 16 miles southwest of the REP site (CH2MHill 2004\_, Biological Assessment, pg 1).

The climate in the project area is mediterranean with hot, dry summers and mild, wet winters. Monthly average temperatures range from 40.5°F to 94.7°F. Temperatures exceeding 90°F occur on average 87 days per year and temperatures below 32°F occur on average three days per year. From 1993 through 2002, annual precipitation for the City of Sacramento ranged from 11.82 inches (1999) to 28.90 inches (1998), with a 10 year average annual precipitation of 21.1 inches (Roseville 2003a, Section 8.15.1.1).

The REP is situated on a 40 acre City of Roseville parcel within the Pleasant Grove and Kaseberg creek watersheds. The project site is located on a gently rolling, low gradient alluvial fan with an average elevation of approximately 92 feet above mean sea level (msl) and an average grade of about five percent. The REP construction-site is bordered on the north by private property and Pleasant Grove Creek; on the east by an open parcel belonging to the City of Roseville; on the west by private property; on the south by Phillip Road and the Pleasant Grove Waste Water Treatment Plant (PGWWTP) (CH2MHill 2004\_, Biological Assessment, pg 1).

## **SOILS**

The 40 acre City owned parcel and surrounding areas consist of a wide variety of soil types ranging in texture from silty clays to silty sands that are derived from older fan deposits of the Quaternary Riverbank and Turlock Lake formations

The REP construction area, which includes the power plant site, construction laydown area, recycled water pipeline, sanitary wastewater pipeline, and stormwater outfall, is situated entirely within the Cometa Ramona sandy loam soil series. The Cometa Ramona sandy loam soil has a permeability that is moderately slow to very slow and is well drained, with a slight erosion hazard.

The proposed natural gas pipeline crosses several soil series; the most prominent being the Fiddymont Cometa Kaseberg and the Cometa Ramona series. The soils within those series are mostly deep and well drained that have formed on terraces. The depths, permeability, erosion potential, and shrink swell behavior of the soil types associated with all REP facilities are listed in Table 8.11-1 of the Application for Certification (AFC) and their locations identified on Figure 8.11-1 of the AFC (Roseville 2003a, Section 8.11.1).

## **SURFACE WATER**

The REP site lies within the North American Subbasin where the principal drainages are the Sacramento, American, Feather, and Bear rivers. The 40 acre City owned parcel, which includes the REP site, is situated within the Pleasant Grove and Kaseberg Creek watersheds with the REP site located 0.25 mile south of Pleasant Grove Creek. Smaller creeks and tributaries to Pleasant Grove Creek are situated to the east of the project site, with the closest being the unnamed tributary of Pleasant Grove Creek lying approximately 1,000 feet to the east of the REP site.

Pleasant Grove Creek drains from the Sierra Nevada foothills approximately 1.5 miles north of Rocklin into the Natomas Main Drainage Canal. From the Natomas Main Drainage Canal, water from Pleasant Grove Creek eventually enters the Sacramento River about 15 miles downstream from the project site. Two other main tributaries to Pleasant Grove Creek, Kaseberg Creek and South Branch Pleasant Grove Creek, are located approximately two miles east of the REP site (CH2MHill 2004b, Section 2.4).

## **GROUNDWATER**

The project site is situated within the North American Subbasin of the Sacramento Valley Groundwater Basin. The North American Subbasin is approximately 30 miles long and 25 miles wide with a surface area of approximately 548 square miles. The subbasin contains both an upper and lower aquifer system with most of the groundwater produced in the northern portion of the subbasin. The REP is located within the interior portion of the subbasin with a groundwater level at 108.5 feet below ground.

Recharge to the aquifers comes almost exclusively from runoff from the Sierra Nevada with the greatest percentage of recharge from the northern Sacramento Valley. No artificial recharge is known to occur within the subbasin. However, the City of Roseville is evaluating a feasibility study for aquifer storage and recovery where surface water would be injected into the aquifer during wet years for storage and then pumped out during dry years (Roseville 2003a, Section 8.15.1.2).

## **PROJECT WATER SOURCES**

### **Water Supply**

The City of Roseville obtains 99 percent of its water supply from Folsom Lake with the remaining one percent from recycled water generated by the City's existing Dry Creek Waste Water Treatment Plant (DCWWTP). The City uses groundwater for short term backup supply during dry years and has four wells capable of producing a combined output of 6,600 acre feet per year (AFY).

The project's cooling water and process makeup water will be supplied entirely by tertiary treated recycled water from the adjacent PGWWTP via a pipeline that crosses Phillip Road. Recycled water will also be used on-site for fire suppression and landscape irrigation. The total availability of recycled water from the PGWWTP in 2005 will be 5.24 million gallons per day (mgd) with the maximum REP demand projected to be 1.71 mgd.

The REP site will use groundwater from an on-site well for potable and domestic uses. The City has tested one of the three existing wells on the project parcel and determined that its quality and pressure are sufficient to serve the project. The anticipated REP demand for groundwater from the onsite well is estimated to be approximately 0.5 gallons per minute (gpm) or less than 1 AFY.

Because the PGWWTP is not operational, water quality parameters from the City's DCWWTP and on-site wells are shown on **Soil and Water Resources Table 1**. The

recycled water from the PGWWTP is expected to be similar to the water from the DCWWTP (Roseville 2003a, Section 8.15.2.2).

**Soil and Water Resources Table 1**  
**Expected PGWWTP Reclaimed Water & Groundwater Quality**

<b>Water Quality Parameter<sup>a</sup></b>	<b>PGWWTP<sup>b</sup></b>	<b>On-site Well<sup>c</sup></b>	<b>Drinking Wtr Standard<sup>d,e</sup></b>
<b>General Parameters</b>			
Alkalinity, Total (mg/L)	60	101	None
Bicarbonate (mg/L)	N/T	N/T	None
Hardness (as CaCO <sub>3</sub> ) (mg/L)	107.5	109	200
Nitrate (as NO <sub>3</sub> ) (mg/L)	6.5	1	45 <sup>c</sup>
pH	6.9	8.0	6.0 – 9.0
Total Dissolved Solids (mg/L)	398.5	250	1,000 <sup>d</sup>
<b>Chemical Parameters</b>			
Arsenic (µg/L)	<1.0	5.1	50 <sup>c</sup>
Boron (mg/L)	267.5	0.17	None
Cadmium (µg/L)	<0.2	N/T	5 <sup>c</sup>
Calcium (mg/L)	40.2	19	None
Chloride (mg/L)	103.5	34	500 <sup>d</sup>
Chromium, Total (µg/L)	1.2	7.5	50 <sup>c</sup>
Copper (µg/L)	4.9	N/T	1,000 <sup>d</sup>
Fluoride (mg/L)	1.25	0.21	1.8 <sup>c</sup>
Lead (µg/L)	<1	N/T	Action Level=15
Magnesium (mg/L)	4.45	15	None
Manganese (mg/L)	0.054	N/T	2 <sup>c</sup>
Nickel (µg/L)	2.3	N/T	100 <sup>c</sup>
Potassium (mg/L)	12	1.3	None
Silver (µg/L)	0.014	N/T	100 <sup>c</sup>
Sodium (mg/L)	75	24	None
Sulfate (mg/L)	37	7.1	500 <sup>d</sup>
Zinc (µg/L)	46	N/T	5000 <sup>d</sup>
<sup>a</sup> For common inorganic water quality constituents <sup>b</sup> Based on quality of recycled water from the City's Dry Creek Waste Water Treatment Plant <sup>c</sup> Source: MWH Laboratories, 2003. <sup>d</sup> Maximum contaminant level as specified in Table 64431 A of Section 64431, Title 22, of the CCR. <sup>e</sup> Secondary maximum contaminant level as specified in Table 64449 B of Section 64449, Title 22, of the CCR. mg/L = milligrams per liter µg/L = micrograms per liter <MDL = below method detection limit N/T = Not tested by City			

Roseville 2003a, Table 8.15 3

## PROJECT DESCRIPTION

The REP consists of a proposed natural gas fired combined-cycle power plant and associated natural gas, reclaimed water supply, and sanitary wastewater pipelines. Major components of the plant include two combustion turbine generators (CTGs), one steam turbine generator (STG), two heat recovery steam generators (HRSGs), one plume abated wet cooling tower, a zero liquid discharge (ZLD) system, and a new 60

kilo Volt (kV) switchyard. The switchyard will connect with the future 60 kV double circuit transmission line that will be located adjacent to the REP switchyard on Phillip Road. No new transmission lines will be required.

The REP is situated within a 40 acre City of Roseville parcel. The fenced power plant and switchyard will encompass approximately 12 acres while the laydown area will use an additional 24.75 acres. The total project site will encompass 36.75 acres. Access to the plant will be via the existing Phillip Road that runs between the REP and the PGWWTP (CH2MHill 2004\_, Biological Assessment, pg 1).

Natural gas will be delivered to the site by Pacific Gas & Electric Company (PG&E) from a gas distribution line located approximately six miles southeast from the REP site. For cooling tower makeup, fire protection, process makeup, and service water, a 50-foot long pipeline will supply tertiary treated recycled water from the PGWWTP. Sanitary wastewater will be piped to the PGWWTP's influent junction structure located approximately 800 feet east of the project site. Potable water for domestic purposes will be provided from an on-site well (CH2MHill 2004b).

## **PROJECT RELATED IMPACTS**

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### **DIRECT AND INDIRECT IMPACTS**

#### **SOIL**

#### **Erosion Control and Stormwater Management**

##### **Power Plant Construction and Operation**

The general site grading of the REP site will establish a working construction surface and provide positive drainage for site buildings and structures. Earthwork at the site will consist of excavation for foundations, underground pipe and utility trenches, and two hydraulically connected stormwater detention ponds.

During the early phases of construction, temporary erosion and sediment control measures will direct stormwater runoff to the natural runoff swale at the northeastern end of the site. After final site grading and construction of the stormwater detention ponds, stormwater runoff will be directed to the detention ponds. The detention ponds will be constructed for sediment and contamination control and will be designed to release on-site stormwater runoff to the unnamed tributary of Pleasant Grove Creek that lies approximately 1,000 feet east of the REP site (Roseville 2003a, Section 8.15.2.4).

Subsequent soil disturbances during construction are expected to result in short term increases in water and wind erosion. RE is required, under Section 402 of the Clean Water Act, to comply with the statewide NPDES permit for stormwater discharges associated with construction and industrial activities. Project design, the Storm Water Pollution Prevention Plans (SWPPP), and the Erosion and Sediment Control Plan

(ESCP) will include measures to control stormwater pollution, erosion and other forms of soil degradation.

RE is required under Conditions of Certification **SOIL & WATER 1 & 2** to obtain a NPDES permit for construction activities and to prepare a construction SWPPP and an ESCP prior to starting construction activities. Once construction of the REP is complete, RE is required under Conditions of Certification **SOIL & WATER 3** to prepare a industrial SWPPP for operation of the REP. No significant impacts are expected if Conditions of Certification **SOIL & WATER 1, 2 and 3** are implemented.

### **Natural Gas Pipeline**

The natural gas pipeline will be a 10 to 16 inch diameter pipe that will be constructed from the REP site to the existing PG&E gas connection point along Baseline Road. RE proposes to use trenching, jack and bore, or horizontal directional drilling (HDD) for the approximately six mile long pipeline. The route will cross several major waterways including four crossings of Kaseberg Creek and one crossing of Curry Creek.

Construction impacts will include soil disturbance associated with trenching and jack and bore construction with the potential to cause accelerated soil erosion from wind or water. If HDD is used at Kaseberg or Curry creeks, it will involve drilling from the ground surface adjacent to the creek using a technique that guides the direction of the drill to pass under the creek and emerge on the ground surface on the opposite side without disturbing the creek bed. Staging areas are required at the entry and exit points of the drill.

HDD is used to avoid disturbance of water courses and wet areas. There are, however, potential water quality impacts associated with HDD. Those potential impacts include occasional unintended fracturing (frac-outs) of the ground above the drill resulting in a pathway through which drilling mud discharges onto the ground surface or streambed. Although not generally toxic, the drilling mud can cause turbidity impacts or coat streambed surfaces to the detriment of aquatic life. Frac-outs can sometimes be difficult to detect, particularly in streams with flowing water.

Trenching for pipeline installation and vehicular travel within the construction corridor will temporarily disturb soils and potentially increase wind and water erosion. However, appropriate erosion and fugitive dust control measures would be implemented during construction. , A California Department of Fish and Game 1601 Streambed Alteration Agreement will be needed prior to crossing Kaseberg and Curry creeks. Depending on the construction method used, an ACOE Nationwide permit may also be required. The applicant has not yet determined whether the City of Roseville or PG&E will construct the natural gas pipeline (CH2Mhill 2004b, Section 1.3). In either case, they will be required, under Section 402 of the Clean Water Act, to comply with the statewide NPDES permit for stormwater discharges associated with construction activities and will be required to implement temporary and permanent best management practices (BMPs) to prevent soil erosion and sediments from affecting surface water.

As the owner operator of the REP, RE is required under Conditions of Certification **SOIL & WATER 1 & 2** to provide the Compliance Project Manager (CPM) with copies of the

construction activity SWPPP and ESCP for all elements of the REP. No significant impacts to soil or water resources are expected.

### **Sanitary Wastewater Pipeline**

The sanitary wastewater pipeline will be a three to six inch diameter, 800-foot pipeline constructed from the REP site to the PGWWTP influent junction structure located east of the REP. Construction impacts will include soil disturbance associated with trenching and will have the potential to increase wind and water erosion.

The sanitary wastewater pipeline will be constructed across an unnamed tributary to Pleasant Grove Creek. Stream crossings where HDD would not be used would be crossed by open trench. Potential construction-related impacts of an open trench crossing include:

1. increased sediment delivery to the stream flow through disturbance of the channel bed and banks during construction;
2. sediment deposits to the streambed through disturbance of the channel bed and banks during construction;
3. destabilization of the channel bed and banks resulting in long-term erosion; and
4. introduction of foreign contaminants through the use of heavy machinery in the streambed.

However, appropriate erosion and fugitive dust control measures would be implemented during construction. RE has provided a draft SWPPP that identifies temporary and permanent BMPs to prevent soil erosion and sediments from affecting surface water. Other BMPs specific to trenched stream crossings include construction in the dry season, diversion of stream flows around the active excavation area through the use of coffer dams, installation of temporary culverted crossings for heavy equipment, and regular maintenance and inspection of heavy equipment used in the stream channel to minimize the introduction of foreign pollutants.

A California Department of Fish and Game 1601 Streambed Alteration Agreement will be needed prior to the creek crossing. Depending on the construction method used, an ACOE Nationwide permit may also be required. Under the NPDES permit and implementation of the SWPPP and ESCP (Conditions of Certification **SOIL & WATER 1 & 2**), no significant impacts are expected.

### ***Pipeline Scour Potential***

Natural stream channels are subject to streambed and bank scour during flood events. Bed scour is usually not visible because it occurs during a flood and ceases as the flood subsides. Bank erosion is more evident because the effects can be seen well after the flood. Pipelines buried below and adjacent to active stream channels can be uncovered and exposed by bank erosion or streambed scour. Exposure of the pipeline could result in pipeline rupture through the action of flowing water and debris, or through third party action after the exposure has occurred. Rupture of the gas pipeline could result in water contamination or fire hazard, while rupture of the sanitary wastewater pipeline would result in surface water contamination.

The potential for exposure of the pipeline by stream erosion and scour can be minimized by locating the pipeline below the expected 100 year depth of scour at stream crossings and extending this depth of burial a sufficient distance away from the streambed to avoid anticipated lateral erosion. Condition of Certification

**SOIL&WATER 7** requires an analysis (plan) prepared by a registered civil engineer that demonstrates that the proposed pipelines (natural gas and sanitary wastewater) will be below the expected 100 year depth of scour at all stream crossings.

## **SURFACE WATER**

Due to the proximity of the proposed REP site to Pleasant Grove Creek (0.25 mile) and its unnamed tributary (approximately 1,000 feet), the potential for site flooding and surface water degradation has been evaluated. Water surface elevations for the 100 year storm are contained in the June 2003 **Master Drainage Study for the Fiddymont and Westpark Properties** (Wood-Roger 2003) and were evaluated for Pleasant Grove Creek in the vicinity of the REP construction area. The Fiddymont and Westpark properties make up the 3,162 acre area surrounding the REP, which will be developed as the West Roseville Specific Plan (WRSP).

The purpose of the **Master Drainage Study for the Fiddymont and Westpark Properties** was to determine the potential drainage impacts from the build-out of the WRSP on the Pleasant Grove and Curry creek watersheds. As part of the study, the entire Pleasant Grove Creek watershed upstream of the REP was modeled using the Hydrologic Engineering Center-River Analysis System (HEC-RAS) and the results evaluated to delineate the 100 year flood plain for Pleasant Grove Creek and its tributaries. The HEC-RAS study used hydrologic modeling based on the ultimate build-out of the Fiddymont property to determine the 100 year water surface elevation in Pleasant Grove Creek and its unnamed tributary. The results of the HEC-RAS analysis were used to delineate the 100 year flood plain, which closely matches the Federal Emergency Management Agency flood elevations shown on **Soil and Water Resource Figure 1**. For the unnamed tributary east of the REP, the HEC-RAS indicates a 100 year flood water level of 86 feet above msl at the southeast corner of the laydown area decreasing to 83 feet above msl at the confluence of Pleasant Grove Creek northeast of the laydown area.

As shown on **Soil and Water Resource Figure 1**, portions of the of the laydown area are within the 100 year flood plain and flood water will inundate the PGWWTP influent junction structure. The flooding of the laydown area will not result in significant impacts. The occurrence of the 100 year storm is not likely during the 18 months of plant construction. Therefore, surface water degradation from minor flooding of the laydown area is not anticipated. The potential for contamination from flooding of the influent junction structure is of concern, as there is the potential for surface water contact with raw sewage from the influent junction structure.

The results of the HEC-RAS indicate a flood water level in the unnamed tributary to be 86 feet above msl at the southeast corner of the laydown area decreasing to 83 feet above msl at the confluence of Pleasant Grove Creek. The final grade of the REP site will be 94 feet above msl, which is above the predicted 100 year floodplain. Within the



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SOIL AND WATER RESOURCES

**SOIL AND WATER RESOURCES - FIGURE 1**  
Roseville Energy Park - Conceptual Project Construction Area Boundaries and FEMA Floodplain





site, plant stormwater runoff will drain to two hydraulically connected detention ponds that will be designed for gravity flow with hydraulic grade lines of 85 feet above msl for the upper pond and 81.5 feet above msl for the lower pond. With the 100 year flood level above 83 feet msl at the outfall location, the lower detention pond is subject to inflow from the tributary during a 100 year flood. No analysis has been provided by the applicant on the potential impacts from this reverse flow.

## **Water Supply**

The City of Roseville will provide process water for the REP from the PGWWTP. The PGWWTP will supply tertiary treated recycled water to meet cooling and process makeup requirements. Cooling and process demands include water for cooling tower evaporation, steam cycle makeup, combustion turbine generator (CTG) air inlet cooling; CTG wash water; and CTG water injection for pollution control and increased power output (GE LM6000 combustion turbine). A one million gallon, above ground storage tank will be constructed on-site to store recycled water for fire protection and provide capacity for intermittent daily peak loads. In Data Request 54, staff asked if this was the only source of backup water supply and what source of cooling water would RE use if the event PGWWTP supply is unavailable due to equipment failure or other reasons. In response to Data Request 54, the Applicant states, *"Because of the reliability and redundancy inherent in the design of modern day wastewater treatment plants such as the PGWWTP, interruptions in the supply of recycled water exceeding 10 hours are expected to be extremely rare. Nonetheless, in the event there is an interruption in the supply of recycled water that causes the exhaustion of the process storage available in the service/firewater storage tank, the REP will shut down due to the lack of a back up water supply (CH2MHill 2004a, DR 54)."*

RE prepared the AFC to allow the flexibility to use either the General Electric LM6000 PC SPRINT (GE LM6000) combustion turbines or the Alstom GTX100 combustion turbines. Because the GE LM6000 will consume slightly more water than the Alstom GTX combustion turbines, cooling and process water consumption will be shown for the "worst case" GE LM6000 design (Roseville 2003a, Section 7.1).

Operation of the REP will require up to 1,247 acre-feet of recycled water annually. The average annual water requirements for the major water consuming equipment and plant processes of the GE LM6000 are shown in **Soil and Water Resources Table 2**.

**Soil and Water Resources Table 2**  
**REP Daily and Annual Water Requirements**

<b><i>Recycled Water (GE LM6000 Combustion Turbine)</i></b>	<b><i>Daily Requirements (gallons)</i></b>	<b><i>Annual Requirements (acre-feet)</i></b>
Circulating Water System Makeup	969,400	1,083
Demineralized Steam Generator Makeup	120,000	137
Evaporative Cooler Makeup	24,000	27
<b>TOTAL</b>	<b>1,113,400</b>	<b>1,247</b>

Source: Roseville 2003a, AFC Figures 7.1 1&2

Through the use of recycled water for all nonpotable uses, the operation of the REP will have no impacts on fresh water resources.

### **Water Quality**

Process water for the REP will be supplied by the City of Roseville through the City's PGWWTP. The PGWWTP will supply tertiary treated recycled water that has undergone screening, grit removal, extended aeration, secondary clarification, filtration, chlorination, and dechlorination. The recycled water will meet the California Code Of Regulations, title 22, Division 4 requirements for "unrestricted use."

All recycled water pipelines, storage tanks, and ancillary facilities will be constructed in compliance with Titles 17 and 22. Title 17 addresses the requirements for backflow prevention and cross connections, while Title 22 addresses public health and use restrictions. A Title 22 Engineer's Report must be submitted and approved by the State Department of Health Services and the Central Valley Regional Water Quality Control Board (CVRWQCB). The CVRWQCB will issue reclamation requirements to ensure that the recycled water is properly treated and safely used.

Use of recycled water will cause the least impact to the environment and is consistent with state water policy for water conservation and maximum reuse of wastewater.

### **Construction Water Supply**

Based on data provided by the Applicant in their December 8, 2003, Supplement in Response to Data Adequacy Comments, construction water use for the REP by project element is presented in **Soil and Water Resources Table 3**.

**Soil and Water Resources Table 3**  
**REP Construction Water use by Project Element**

<i><b>REP Element</b></i>	<i><b>Peak Daily Requirements (gpd)</b></i>	<i><b>Annual Requirements (gpy)</b></i>
Plant and Laydown Area	1,400,000	9,100,000
Natural Gas Pipeline	110,000	1,400,000
Transmission Line	15,000	500,000

Source: Roseville 2003b, Table 8.15 S1, pg. S 56

As shown, the maximum amount of construction water for the REP site and laydown area is estimated to peak at 1,400,000 gpd and have an annual requirement of 9.1 mgy. This is over four times the 2.16 mgy reported in Section 8.15.2.3 of the AFC. Because of the large discrepancy in the projected amounts of water required for construction activities, additional information is required from the applicant before a complete assessment of potential impacts can be made.

With the PGWWTP scheduled for commercial operation in August 2004, tertiary treated water for unrestricted use will be available for construction activities. The Recycling Act of 1991 (Water Code § 13575 et seq.) encourages the use of recycled water where applicable. Due to the proximity of the REP to the PGWWTP, the use of recycled water for soil compaction, dust suppression and other construction activities is feasible and

economically achievable. Therefore, the use of recycled water for all construction activities is required under the City's Recycle Water Policy (Roseville Municipal Code Section 14.17.010 B).

## **Spill Prevention**

The REP draft Spill Prevention Control and Countermeasure (SPCC) Plan covers chemical spill control and management of the hazardous materials that will be stored and used onsite. As described in the draft SPCC and draft SWPPP, hazardous materials at the REP will be stored indoors in watertight containers and/or surrounded by secondary containment structures. Bermed containment will be used in areas used for bulk hydrocarbon storage. Some of the hazardous materials used during construction include petroleum hydrocarbons, cleaning fluids and solvents.

Acutely hazardous materials stored onsite during operation of the proposed REP facility include sulfuric acid and aqueous ammonia. Those materials would be stored in above ground storage tanks that would be surrounded by curbed concrete containment basins. Other containment/treatment facilities include berms, concrete sumps, and an oil/water separator. Staff does not expect significant impacts to result from on-site spills due to the procedures and BMPs described above and included in the draft SPCC and draft SWPPP (CH2MHill 2004b and CH2MHill 2004d). See the **Hazardous Materials Management** section of this document for further information regarding the use of these materials.

## **GROUNDWATER**

### **Water Supply**

The City uses groundwater for short term backup supply during dry years and has four wells capable of producing a combined output of 6,600 AFY. The applicant proposes to use an on-site well to provide groundwater for domestic and sanitary purposes at the REP site. Consumption is expected to be approximately 0.5 gpm, which is less than 1AFY. The City has tested a nearby well and confirmed that it meets quality and pressure standards for use as a potable water source for the REP. Water quality parameters for local groundwater are reported in **Soil and Water Resources Table 1** (Roseville 2003a, Section 8.15.2.2).

Staff has informally requested an updated site delineation with all existing structures and utilities shown. The location of the on-site well used to provide potable water for the REP and the associated distribution pipeline, treatment facilities and storage tanks must be shown, and a description of its operation provided, in order for staff to complete the potable water supply assessment.

### **Water Quality**

Activities at REP will have minimal potential to impact groundwater resources in the project area. The depth to groundwater is estimated to be more than 100 feet below the REP surface. Stormwater runoff from the hazardous materials containment portions of the plant site will be discharged through an oil/water separator and then to the cooling tower basin. Stormwater runoff from other portions of the plant site will be directed by

surface flow through a collection of catch basins and ditches to the on-site stormwater detention ponds. No underground chemical storage tanks are proposed at the project site. No releases of contaminated stormwater from the plant site are expected.

### **Spill Prevention**

Solid wastes and small amounts of hazardous waste that are generated will be properly accounted for, tracked, handled, and disposed of off-site using licensed transporters and disposal facilities. No significant impacts to groundwater resources are expected from the construction or operation of the REP project.

## **WASTEWATER DISCHARGE**

### **Construction Wastewater**

The construction phase of REP will require minimal dewatering requirements. All excavations will be above the existing water table. Dewatering requirements are expected to consist of stormwater from plant excavations only. The quantity of stormwater collected is expected to result in only several days of dewatering during construction. For the REP project, it is expected that the potential for site dewatering will only occur over a single rain season. The maximum daily dewatering discharge is estimated to be 72,000 gallons.

Water used for dust control and soil compaction during construction will not result in discharge. During the construction period, sanitary waste will be collected in portable toilets (no discharge) supplied by a licensed contractor and disposed of at an appropriate receiving facility. Equipment wash water will be collected and disposed of off-site (Roseville 2003a, Section 8.15.2.4).

As proposed, hydrostatic test water for the natural gas pipeline will be drawn from City potable water supplies. Approximately 50,000 gallons of water will be used for hydrostatic testing of power plant piping. However, as with the use of construction water, staff recommends the use of recycled water for hydrostatic testing.

Hydrostatic test water will be chemically analyzed for contaminants and discharged into a dewatering structure. Depending on water quality, the water will be discharged into the City of Roseville sanitary wastewater system or to tributary drainages to Pleasant Grove Creek under the appropriate State and City discharge permits. Discharges of hydrostatic test water are not expected to affect waters of the state.

### **Cooling Tower Blowdown**

Circulating (or cooling) water system blowdown will consist of recycled water that has been concentrated by approximately five cycles of concentration and will contain the residue of the chemicals added to the circulating water. Cooling water treatment will require the addition of a pH control agent, a mineral scale dispersant, corrosion inhibitors, and biocides. The waste stream will be treated in an on-site ZLD system where the water evaporated by the brine concentrators will be reclaimed using a condenser producing a distillate very low in total dissolved solids (TDS). The distillate will be recovered for reuse within the REP. The resulting residue from the ZLD process

will be disposed of at an appropriately licensed facility. No impacts to surface or groundwater resources are anticipated (Roseville 2003a, Section 8.15.2.4).

### **Zero Liquid Discharge**

All process wastewater streams (oil/water separator effluent, filter backwash, quenched HRSG blowdown, crystallizer condensate, and excess distillate) will be directed to the cooling tower for initial concentration and then to the ZLD system. The volume of the cooling tower blowdown going to the ZLD is expected to be from 96 to 116 gpm under average conditions and from 267 to 278 gpm under peak conditions.

The brine concentrators of the ZLD system will use heat to evaporate approximately 96 percent of the feed water. The concentrated brine will be sent to the crystallizers where it will be further concentrated into a salt sludge. The sludge will be dewatered using either a filter press or belt press. The residual solid waste exiting the press will be discharged to a storage bin. The relatively dry solid waste will be transported off-site for disposal at an appropriate landfill. Operation of the REP will produce approximately 121 tons of solid waste per year if operated at its full permitted output (Roseville 2003a, Section 7.4.1.1).

Since all process wastewater will be eliminated through the ZLD process, the operation of the REP will not cause or contribute to impacts to surface or groundwater resources.

### **Sanitary Wastewater**

The project will include sanitary facilities designed to handle the plant's domestic wastewater. No septic tanks are proposed on-site, and sanitary wastes from the REP will be conveyed via pipeline to the PGWWTP. Therefore, no potential adverse impacts to surface or groundwater sources are anticipated (Roseville 2003a, Section 8.15.2.6).

### **Plant Drainage**

Miscellaneous plant drainage will consist of process water drainage, equipment leakage, and drainage from facility containment areas. Water from those areas will be collected in a system of floor drains, sumps, and pipes within the REP and discharged to an oil/water separator. The oil free discharge water will be recycled to the cooling tower basin. Oil collected by the oil water separators will be transported off-site for disposal or recycling. No potential adverse impacts to surface or groundwater resources are expected.

## **SURFACE WATER QUALITY AND FLOODING**

The 10 year storm will cause surface water runoff from the developed REP site to increase from 5.7 cfs to 9.1 cfs for a net increase of 3.4 cfs. The 100 year stormwater runoff is estimated to increase from 13.4 cfs to 18.1 cfs for a net increase of 4.7 cfs (Roseville 2003a, Section 8.15.2.5). Post development runoff rates for the 10 year and 100 year storm are not excessive. The HEC-RAS modeling of pre and post WRSP runoff confirms that detention of stormwater runoff is not desirable in the location of the REP (*Master Drainage Study for the Fiddymont and Westpark Properties*, June 2003).

The operation of the detention ponds for on-site stormwater runoff will be based on continuous releases during storm event as described in the draft SWPPP and will be in accordance with the provisions of the NPDES permit. No potential adverse impacts to surface water resources are anticipated.

## **ANALYSIS OF CUMULATIVE IMPACTS**

### **Erosion Control and Stormwater Management**

Stormwater runoff typically increases with urbanization and new construction activities. REP construction and operation will only have minor and temporary effects on soil resources. Stormwater discharge will adhere to a SWPPP/ESCP BMPs and is expected to comply with both the City of Roseville and CVRWQCB water quality standards. Contribution to cumulative erosion and sediment impacts are expected to be minor. Therefore, the REP will not contribute significantly to cumulative impacts to soil resources.

### **Surface Water**

#### **Water Supply**

REP's cooling, process makeup, fire suppression, and landscape irrigation water will be supplied entirely by tertiary treated recycled water from the PGWWTP. The PGWWTP is designed and permitted to treat approximately 12.5 mgd average dry weather flow (CH2MHill 2004f, DR 83).

The PGWWTP is scheduled to be in commercial operation by August 2004 (CH2MHill 2004f, DR 83). The plant will produce an average supply of approximately 6.5 mgd in 2005, increasing to 12.5 mgd by 2020. The REP will use 0.71 mgd of recycled water for cooling under average conditions (1.71 mgd under maximum conditions). The PGWWTP will have an adequate supply of tertiary treated water for the needs of the REP and other recycled water needs. The use of recycled water by the REP will not affect the City's potable water supply or the regional demand for fresh water. Therefore, no significant cumulative impacts are expected.

#### **Groundwater**

The City of Roseville's Water Forum Agreement (WFA) allows the City to use a maximum of 6,500 AFY of groundwater (the sustainable groundwater extraction rate), which is to be used during dry years as defined by the WFA. The Water Forum is a group of stakeholders that negotiated and signed the Water Forum Agreement in order to guide sustainable water use of the lower American River (Water Forum 2000). REP groundwater usage is projected to be less than 1 AFY and will be less than 0.02 percent of the groundwater resources allotted to the City of Roseville under the WFA (Roseville 2003a, Section 8.15.2.6).

No significant cumulative impacts are expected to groundwater resources since the amount of groundwater required to meet the REP's potable needs is so small.

## **Wastewater Discharge**

Since there will be no wastewater discharge from the REP, there will be no cumulative impacts to water quality. Sanitary wastewater will be piped to the PGWWTP, but the volume is small and will not cause a significant cumulative impact.

## **Surface Water Quality and Flooding**

The REP/PGWWTP are bounded on three sides by the Fiddymont and Westpark properties, which will be developed under the WRSP. The WRSP incorporates the 3,162 acres of the Fiddymont and Westpark properties for mixed land use development and is expected to have a 15 year build-out horizon.

Based on the pre and post development HEC-RAS modeling in the June 2003 ***Master Drainage Study for the Fiddymont and Westpark Properties***, the location of the REP and operation of its on-site detention ponds will not contribute to flooding or water quality degradation of Pleasant Grove Creek or its tributary. No cumulative impacts to surface water quality or flooding are expected from construction or operation of the REP.

## **MITIGATION**

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### **APPLICANT'S PROPOSED MITIGATION**

#### **Erosion and Water Pollution Control**

The applicant provided a draft SWPPP that identifies temporary and permanent erosion and water pollution control BMPs. The draft SWPPP for the construction and operation of the REP identifies the following BMPs and commits the applicant to:

- Stabilize disturbed areas that will not be covered with surface structures or pavement following grading and/or cut and fill operations;
- Selectively salvage and replace topsoil in areas to be disturbed or excavated along pipeline routes and where vegetation is present before construction;
- Limit soil erosion/dust generation by wetting active construction areas with water;
- Install detention ponds to minimize off-site discharge of sediments;
- Provide storm drain inlet protection to prevent sediment laden runoff from entering inlets or catch basins;
- Use silt fences, straw bale barriers, and fiber rolls to intercept sediment laden runoff from disturbed soil;
- Provide designated storage areas for construction wastes, hazardous materials, paints, and related products along with covered dumpsters and containers for waste and recyclables;
- train employees on stormwater quality management;
- Implement a spill prevention and control plan;

- Remove construction wastes in a timely manner;
- Store all liquid wastes in covered containers;
- Provide emergency spill containment kits and materials in areas of potential hazardous materials release;
- Provide for contaminated soil identification and disposal; and
- Provide dewatering provisions in the SWPPP in the event of groundwater contact or stormwater inflow during excavation.

## **STAFF PROPOSED MITIGATION**

### **Stormwater Pollution**

Energy Commission staff recommends specific timeframes for submittal of the Construction SWPPP and ESCP in staff's proposed Conditions of Certification **SOIL & WATER 1 & 2**. Staff proposed mitigation measures that shall be included in the Construction and Industrial SWPPPs and the ESCP are listed below.

#### **Storm Water Pollution Prevention Plans**

For both the Construction and Industrial SWPPPs, water pollution control and stormwater management drawings must accompany the narrative portion of the plan. All drawings and narrative must be detailed, specific, and include the following elements for the proposed REP.

- Graphics/drawings that show topographic features of all proposed project elements including those related to the construction corridors of all proposed pipelines, and the 24.75 acre laydown area. The mapping scale shall be 1"= 100' or less (1"=50' recommended). The graphics/drawings must depict the surrounding area including existing linears, structures, drainage facilities and diversion swale(s).
- All proposed facilities including stormwater control features shall be shown on the site plan drawings. The drawings shall contain a complete mapping symbol legend that identifies all existing and proposed features including the soil boundary(s) and a limit of construction. The limit of construction boundary shall include the project site, pipelines, laydown and stockpile areas. The limit of construction ensures all work is confined to the proposed REP construction area in order to protect the surrounding areas not involved in construction or operation of the REP.
- Provide a detailed and specific construction sequence that addresses the entire sequence of events from initial site mobilization to final site stabilization (e.g. vegetation/asphalt).
- All site specific BMPs must be depicted on the water pollution control and stormwater management drawings and discussed in the narrative.

#### **Erosion and Sediment Control Plan**

Erosion and sedimentation are concerns at the REP construction site and pipeline corridors. Additional measures beyond those proposed in the AFC are needed to



protect soil and water resources in the vicinity of the REP. RE must implement a site specific ESCP that includes the following elements.

***Vicinity Map*** – A map shall be provided indicating the location of all project elements with depiction of significant geographic features to include watercourses, creeks, wetlands, and sensitive habitat.

***Site Delineation*** – The REP site and all project elements shall be delineated showing boundary lines of all construction areas and the location of existing and proposed structures, pipelines, roads, and drainage facilities.

***Watercourses and Critical Areas*** – The ESCP shall show the location of watercourses and critical areas such as creeks, rivers, wetlands and other environmentally sensitive areas. Indicate the proximity of those features to the REP construction site and all pipeline construction corridors.

***Drainage*** – The ESCP shall provide a topographic site map showing existing, interim and proposed drainage systems; drainage area boundaries and water shed sizes in acres; the hydraulic analysis to support the selection of BMPs to divert off-site drainage around or through the plant and laydown areas; and all pipeline trenching and boring sites. On the map, spot elevations are required where relatively flat conditions exist. The spot elevations and contours shall be extended off-site for a minimum distance of 100 feet in flat terrain.

***Clearing and Grading*** – The plan shall provide a delineation of areas to be cleared of vegetation and areas to be preserved. The plan shall provide elevations, slope, location, and extent of all proposed gradings as shown by contours, cross sections or other means. The locations of any disposal areas, fills, or other special features will also be shown. Illustrate existing and proposed topography tying in proposed contours with existing topography. The ESCP shall include a statement of the quantities of material excavated or filled for each element of the REP (site and pipeline corridors), whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported.

***Project Schedule*** – The ESCP shall identify on the topographic site map the location of the site specific BMPs to be employed during each phase of construction (initial grading, project element excavation and construction, and final grading/stabilization). Separate BMP implementation schedules shall be provided for each project element for each phase of construction.

***Best Management Practices*** – The ESCP shall show the location, timing, and maintenance schedule of all erosion and sediment control BMPs to be used prior to initial grading, during project element excavation and construction, and final grading/stabilization. BMPs shall include measures designed to control dust and stabilize construction access roads and entrances.

***Erosion Control Drawings*** - The erosion control drawings and narrative must be designed and sealed by a professional engineer/erosion control specialist.

Those elements of the ESCP that are also required in the SWPPP can and should be referenced in the construction SWPPP.

## COMPLIANCE WITH LORS

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Through the use of recycled water and a ZLD system, impacts to water resources will be minimized. The use of recycled water is consistent with state water policy for water conservation and maximum reuse of wastewater and is in compliance with water use LORS. Additionally, the use of BMPs to control erosion and sedimentation will ensure compliance with water quality and soil conservation LORS. The REP will comply with all soil and water resources related LORS.

## FACILITY CLOSURE

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The planned operational life of the REP is 30 years. However, the REP could operate for an indefinite period of time depending on its economic viability. An early decommissioning and/or mothballing is also possible. When the facility is closed, the closure procedure will follow a decommissioning plan to be prepared by the Applicant and approved by the Energy Commission Compliance Project Manager.

## CONCLUSIONS AND RECOMMENDATIONS

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Staff commends the applicant for proposing the use of reclaimed water and a ZLD system in order to minimize the use of fresh water during construction and operation of the REP. Staff has not identified any significant soil or water related impacts and concludes the project would comply with LORS if the following Conditions of Certification are adopted.

## CONDITIONS OF CERTIFICATION

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**SOIL&WATER 1:** The project owner shall comply with all of the requirements of the General NPDES Permit for Discharges of Storm Water Associated with Construction Activity. The project owner shall develop and implement a Storm Water Pollution Prevention Plan (SWPPP) for the construction of the entire project. Prior to beginning any site mobilization associated with any project element, the project owner shall submit to the CPM a copy of the Notice of Intent for Construction accepted by the Central Valley Regional Water Quality Control Board (CVRWQCB) and obtain Energy Commission CPM approval of the construction activity SWPPP for the REP.

**Verification:** No later than 60 days prior to the start of site mobilization for any project element, the project owner shall submit a copy of the SWPPP required under the General NPDES Permit for Discharges of Storm Water Associated with Construction Activity to the CPM for review and approval. The final SWPPP will include copies of the Notice of Intent for Construction accepted by the CVRWQCB. Any comments from the City of Roseville regarding the SWPPP, shall be addressed so that the SWPPP conforms to the City's SWPPP submittal requirements. Approval of the SWPPP by the CPM must be received prior to site mobilization for any project element and shall include the following staff proposed elements.

Graphics/drawings that show topographic features of all proposed project elements including those related to the construction corridors of all proposed pipelines, and the 24.75 acre laydown area. The mapping scale shall be 1"= 100' or less (1"=50' recommended). The graphics/drawings must depict the surrounding area including existing linears, structures, drainage facilities and diversion swale(s).

All proposed facilities including stormwater control features shall be shown on the site plan drawings. The drawings shall contain a complete mapping symbol legend that identifies all existing and proposed features including the soil boundary(s) and a limit of construction. The limit of construction boundary shall include the project site, pipelines, laydown and stockpile areas. The limit of construction ensures all work is confined to the proposed REP construction area in order to protect the surrounding areas not involved in construction or operation of the REP.

Provide a detailed and specific construction sequence that addresses the entire sequence of events from initial site mobilization to final site stabilization (e.g. vegetation/asphalt).

All site specific BMPs must be depicted on the water pollution control and stormwater management drawings and discussed in the narrative.

**SOIL&WATER 2:** Prior to beginning any site mobilization activities for any project element, the project owner shall obtain CPM approval for a site specific Drainage, Erosion and Sedimentation Control Plan (ESCP) that addresses all project elements. The plan shall address revegetation and be consistent with the grading and drainage plan as required by Condition of Certification **CIVIL 1**.

**Verification:** No later than 60 days prior to the start of any site mobilization for any project element, the project owner shall submit the ESCP to the CPM for review and approval. The ESCP shall include the following staff proposed elements.

***Vicinity Map*** – A map shall be provided indicating the location of all project elements with depiction of significant geographic features to include watercourses, creeks, wetlands, and sensitive habitat.

***Site Delineation*** – The REP site and all project elements shall be delineated showing boundary lines of all construction areas and the location of existing and proposed structures, pipelines, roads, and drainage facilities.

***Watercourses and Critical Areas*** – The ESCP shall show the location of watercourses and critical areas such as creeks, rivers, wetlands and other environmentally sensitive areas. Indicate the proximity of those features to the REP construction site and all pipeline construction corridors.

***Drainage*** – The ESCP shall provide a topographic site map showing existing, interim and proposed drainage systems; drainage area boundaries and water shed sizes in acres; the hydraulic analysis to support the selection of BMPs to divert off-site drainage around or through the plant and laydown areas; and all pipeline trenching and boring sites. On the map, spot elevations are required where relatively flat conditions exist.

The spot elevations and contours shall be extended off-site for a minimum distance of 100 feet in flat terrain.

**Clearing and Grading** – The plan shall provide a delineation of areas to be cleared of vegetation and areas to be preserved. The plan shall provide elevations, slope, location, and extent of all proposed gradings as shown by contours, cross sections or other means. The locations of any disposal areas, fills, or other special features will also be shown. Illustrate existing and proposed topography tying in proposed contours with existing topography. The ESCP shall include a statement of the quantities of material excavated or filled for each element of the REP (site and pipeline corridors), whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported.

**Project Schedule** – The ESCP shall identify on the topographic site map the location of the site specific BMPs to be employed during each phase of construction (initial grading, project element excavation and construction, and final grading/stabilization). Separate BMP implementation schedules shall be provided for each project element for each phase of construction.

**Best Management Practices** – The ESCP shall show the location, timing, and maintenance schedule of all erosion and sediment control BMPs to be used prior to initial grading, during project element excavation and construction, and final grading/stabilization. BMPs shall include measures designed to control dust and stabilize construction access roads and entrances.

**Erosion Control Drawings** -- The erosion control drawings and narrative must be designed and sealed by a professional engineer/erosion control specialist.

**SOIL&WATER 3:** The project owner shall comply with all of the requirements of the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity. The project owner shall develop and implement a Storm Water Pollution Prevention Plan (SWPPP) for the operation of REP. The project owner shall submit to the CPM a copy of the Notice of Intent for Operation accepted by the CVRWQCB and obtain approval of the General Industrial Activities SWPPP from the Energy Commission CPM prior to commercial operation of the REP.

**Verification:** No later than 60 days prior to the start of commercial operation, the project owner shall submit to the CPM a copy of the SWPPP required under the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity to the CPM for review and approval. The operational SWPPP shall include copies of the Notice of Intent for Operation accepted by the CVRWQCB. Approval of the operational SWPPP by the CPM must be received prior to start of commercial operation. In addition, the project owner shall submit to the CPM copies of the annual monitoring report for stormwater as normally submitted to the CVRWQCB under the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity.

**SOIL&WATER 4:** The REP shall use reclaimed water for construction, hydrostatic testing, cooling tower makeup, process water, landscape irrigation and all other nonpotable uses. The REP shall comply with all requirements of Title 22 and Title 17 California Code of Regulations. Prior to the delivery of

recycled water to the REP, the owner shall submit a Title 22 Engineer's Report that has been approved by the Department of Health Services and the CVRWQCB.

**Verification:** At least 60 days prior to the start of construction of the REP recycled water supply and distribution system, the project owner shall submit to the CPM the water supply and distribution system design demonstrating compliance with this condition. Those features shall be included in the final design drawings submitted to the CBO as required in Condition of Certification **CIVIL 1**. Approval of the final design of the water supply and distribution system by the CPM shall be obtained prior to the start of construction of those systems

**SOIL&WATER 5:** Prior to commercial operation, the project owner shall install metering devices as part of the water supply and distribution system to monitor and record in gallons per day, 1) total volumes of potable and reclaimed water supplied to the REP, and 2) volumes used for cooling purposes, potable water, non cooling process water supplies, irrigation, wash water, demineralized water and turbine injection. Those metering devices shall be operational for the life of the project. An annual summary of daily water use by the REP, differentiating between potable and reclaimed water, shall be submitted to the CPM in the annual compliance report.

**Verification:** At least 60 days prior to REP commercial operation, the project owner shall submit to the CPM evidence that metering devices have been installed and are operational on the pipelines serving and within the project. The project owner shall provide a report on the servicing, testing and calibration of the metering devices in the annual compliance report.

The project owner shall submit a water use summary report to the CPM in the annual compliance report for the life of the project. The annual summary report shall be based on and shall distinguish recorded daily use of potable and recycled water. Included in the annual summary of water use, the project owner shall submit copies of meter records from the City of Roseville documenting the quantities of tertiary treated recycled water provided (in gpd) by the PGWWTP and potable groundwater supplied over the previous year. The report shall include calculated monthly range, monthly average, and annual use by the project in both gallons per minute and acre-feet. After the first year and for subsequent years, this information shall also include the yearly range and yearly average recycled and potable water used by the project.

**SOIL&WATER 6:** Surface or subsurface disposal of process wastewater or contaminated stormwater from the REP is prohibited. The project owner shall treat all non-sanitary wastewater streams with a zero liquid discharge (ZLD) system that results in a residual solid waste.

**Verification:** Within 60 days following the commencement of project operations, the project owner shall submit to the CPM the final design of the ZLD system including schematic, narrative of operation, maintenance schedules, on-site storage facilities, containment measures and influent water quality. This information shall also include the results of the Waste Extraction Test of the residual solid waste from the ZLD system. In the annual compliance report, the project owner will submit a status report on operation

of the ZLD system, including disruptions, maintenance, volumes of interim wastewater streams stored on-site, volumes of residual solids generated and the landfills used for disposal. REP operation and wastewater production shall not exceed the treatment capacity of the ZLD system.

**SOIL&WATER 7:** The proposed gas and sanitary wastewater pipelines shall be located below the anticipated depth of scour from a 100 year flood at all creek crossing locations. The depth of pipeline burial shall be extended a sufficient distance away from the creek banks to avoid anticipated lateral erosion. Trenched water crossings shall be constructed during the dry season using "in the dry" construction techniques that avoid trenching within open or flowing water. Creek beds at trenched crossings shall be restored to their natural contours and revegetated.

**Verification:** At least 60 days prior to site mobilization for the proposed gas and sanitary wastewater pipelines, the project owner shall submit to the CPM, an analysis (plan) prepared by a registered civil engineer. The analysis (plan) shall demonstrate that the proposed pipelines would be below the expected 100 year depth of scour at all creek crossings and will remain at that depth for a sufficient distance from the creek banks to avoid any lateral erosion that can be reasonably expected to occur during the life of the project. The CPM must approve the analysis (plan) prior to any site mobilization activities for those pipelines.

## REFERENCES

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CH2MHill, Sacramento, California (CH2MHill) 2004a. Applicant's Responses to CEC Staff Data Requests 1 – 71. Submitted to the Docket on February 6, 2004

CH2MHill, Sacramento, California (CH2MHill) 2004b. Applicant's Response to CEC staff Data Request 55 – Storm Water Pollution Prevention Plan for Construction. Submitted to the Docket on February 19, 2004.

CH2MHill, Sacramento, California (CH2MHill) 2004d. Applicant's Response to CEC staff Data Request 57 – Spill Prevention, Control, & Countermeasures Plan for Operation. Submitted to the Docket on February 24, 2004.

CH2MHill, Sacramento, California (CH2MHill) 2004e. Applicant's Responses to CEC Data Requests 70-71. Submitted to the Docket on March 1, 2004.

CH2MHill, Sacramento, California (CH2MHill) 2004f. Applicant's Responses to CEC Data Request 83. Submitted to the Docket on March 1, 2004.

Roseville Electric, Roseville, California (ROSEVILLE) 2003a. Application for Certification Volumes I & II. Submitted to the Docket on October 30, 2003.

Roseville Electric, Roseville, California (ROSEVILLE) 2003b. Supplement in Response to Data Adequacy Comments. Submitted to the Docket on December 8, 2003.

Water Forum 2000. The Water Forum Agreement.  
<http://www.waterforum.org/images/PDF/GLOSSARY.PDF> . Pp 404.

Wood-Rogers, Inc. June 2003. Master Drainage Study for Fiddymment-Westpark Properties Volumes I & II.

# **TRAFFIC AND TRANSPORTATION**

James Adams and Eileen Allen

## **INTRODUCTION**

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The Traffic and Transportation Section of this Preliminary Staff Assessment is an objective analysis of the transportation systems in the vicinity of the project and addresses the Roseville Energy Park's (REP) compatibility with applicable laws, ordinances, regulations, and standards (LORS). It also identifies potential impacts related to the construction and operation of the project on the surrounding transportation systems and roadways, and potential mitigation measures to avoid or lessen those impacts. This analysis also includes an evaluation of the influx of large numbers of construction workers, and how, over the course of the construction phase, the movement of these workers can increase roadway congestion and also affect traffic flow.

Staff has analyzed the information provided in the Application for Certification (AFC) and other sources to determine the potential for the REP to have significant traffic and transportation impacts, and has assessed the availability of mitigation measures that could reduce or eliminate the significance of those impacts. Conditions of certification are included to implement the appropriate mitigation measures and to ensure that the project complies with the applicable LORS.

## **LAWS, ORDINANCES, REGULATIONS AND STANDARDS**

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### **FEDERAL**

- Title 49, Code of Federal Regulations. Chapter 11, Subchapter C. These authorities establish national standards for the transportation of hazardous materials.
- Title 49, Code of Federal Regulations, Sections 171-177, governs the transportation of hazardous materials, the type of materials defined as hazardous, and the marking of the transportation vehicles.
- Title 49, Code of Federal Regulations, Sections 350-399, and Appendices A-G, Federal Motor Carrier Regulations, addresses safety considerations for the transport of goods, materials, and substances over public highways.
- Part 77, Federal Aviation Administration (FAA) Regulations, establishes standards for determining obstructions in navigable airspace and sets forth requirements for notification to the FAA of proposed construction. Notification is also required if the structure or obstruction is more than a specified height and falls within any restricted airspace in the approach to airports.

### **STATE**

The California Vehicle Code and the Streets and Highways Code contain requirements applicable to the licensing of drivers and vehicles, and the transportation of hazardous materials and rights-of-way. In addition, the California Health and Safety Code



addresses the transportation of hazardous materials. Provisions within the California Vehicle Code are as follows:

- Section 353 defines hazardous materials.
- Sections 31303-31309 regulate the highway transportation of hazardous materials, the routes used, and restrictions thereon.
- Section 31030 identifies commercial shipping routes for specified waste streams.
- Sections 31600-31620 regulate the transportation of explosive materials.
- Sections 32000-32053 regulate the licensing of carriers of hazardous materials and include noticing requirements.
- Sections 32100-32109 establish special requirements for the transportation of inhalation hazards and poisonous gases.
- Sections 34000-34121 establish special requirements for the transportation of flammable and combustible liquids over public roads and highways.
- Sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5-7, 34506, 34507.5, and 34510-11 regulate the safe operation of vehicles, including those used for the transportation of hazardous materials.
- Section 25160 et seq. address the safe transport of hazardous materials.
- Sections 2500-2505 authorize the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials including explosives.
- Sections 13369, 15275, and 15278 address the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. These sections also require certificates permitting the operation of vehicles transporting hazardous materials.
- California Streets and Highways Code, sections 117 and 660-72, and California Vehicle Code, section 35780 et seq., require permits for the transportation of oversized loads on county roads.
- California Street and Highways Code, sections 660, 670, 1450, 1460, 1470, and 1480, regulates right-of-way encroachment and the granting of permits for encroachments on state and county roads.
- In accordance with Section 21400 of the California Vehicle Code, and per the California Department of Transportation (Caltrans), all construction within the public right-of-way will need to comply with the "Manual of Traffic Controls for Construction and Maintenance of Work Zones."

## **LOCAL**

### **Placer County General Plan**

The Placer County General Plan is the major controlling document for growth and development in Placer County and is evaluated and revised every ten years. The 1994 Plan is under revision and the new plan is expected to be adopted by the Placer County

Board of Supervisors sometime in 2004. The goals and policies for the County's transportation and circulation system can be found in Section Three of the 1994 General Plan. A principal goal is to provide for the long-range planning and development of the county's roadway system to ensure the safe and efficient movement of people and goods (County of Placer 1994).

### **City of Roseville Comprehensive General Plan, Transportation Element**

The Circulation Element of the City of Roseville's General Plan establishes goals, policies, and identifies implementation measures for City traffic and transportation systems, and its provisions are mandated by State law. The Roseville City Council is the administering agency.

The major goals of the Circulation Element are to: ensure that the City's circulation system provides for the safe, efficient, and reliable movement of people and goods; shift from the automobile to other modes of transportation; and provide an adequate level of transportation service for all persons traveling in and through Roseville (City of Roseville 1992). The City General Plan set the performance standards for intersections at LOS C.

### **The Environmental Impact Report for the West Roseville Specific Plan**

The Transportation and Circulation section of the West Roseville Specific Plan describes the roadway improvements that would be needed to meet an acceptable level of service (LOS) when full development of all vacant lands within the sphere of influence is achieved. A portion of the Plan includes roads that surround the REP.

## **SETTING**

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### **REGIONAL SETTING**

The REP project site is located in the City of Roseville in Placer County approximately 15 miles north of Sacramento in California's Northern Central Valley. The Sacramento/Roseville region has an extensive transportation system that includes freeways, highways, bus lines, and rail facilities. The major freeways in the general area include U.S. Highways (Interstate [I]) I-5 and 80, and State Routes (SR) SR-99, SR-70, and SR-65. Regional access to the site is provided by SR-99 and I-5 from the west and south, I-80 from the east, and SR-65 from the north (Roseville 2003a, pg. 8.12-1).

Descriptions of some of the critical roads and highways in the study area are provided below. **Traffic and Transportation Figure 1** illustrates the major highways, roads, and other transportation features in the project area.

The City of Roseville's economy is heavily dependent on the extensive network of highways and roads. Traffic congestion has increased substantially in the last ten years as the number of residents traveling to adjacent communities such as Sacramento to the southwest, and Rocklin to the east, has grown. The heavy reliance on the automobile has exacerbated congestion on the City's arterial roads such as Douglas

Boulevard and Cirby Way. The population of Roseville has increased by almost 80 percent between 1990 and 2003, and was approximately 91,000 as of January 1, 2003. This increase has contributed to an even greater reliance on the automobile as the primary means of transportation.

## **LOCAL SETTING**

As shown in **Traffic and Transportation Figure 1**, I-80, SR-65 and SR-99/70 are the three major highways in the area of the project site. I-80 provides access to the site via Riverside Avenue, Cirby Way, Foothills Boulevard, Pleasant Grove Boulevard, Baseline Road, Fiddymment and Phillip Roads. The site can also be reached by utilizing SR-65, Blue Oaks Boulevard, Fiddymment, and Phillips Roads. SR-99/70 provides access via Baseline, Fiddymment and Phillip Roads. Baseline Road and Blue Oaks Boulevard are east-west arterials with at least three lanes east of Fiddymment Road, which is a north-south arterial with two lanes between Baseline Road and Blue Oaks Boulevard. Phillip Road is both an east-west and north-south arterial with two lanes. It is likely that most traffic coming to the site will use I-80 and SR-65.

The various route options are discussed in the Site Location and Local Street System section of the AFC. **Traffic and Transportation Figure 2** shows traffic counts at various points along the freeways, and local roads in the project area. It also identifies potential construction worker routes, bus routes, bike lanes, and the gas pipeline route.

**Traffic and Transportation Table 1** gives average annual daily traffic (AADT) and existing peak hourly traffic data along several sections of existing roads in the project area. Pleasant Grove Boulevard west of Foothills Boulevard, and Blue Oaks Boulevard west of Woodcreek Oaks Boulevard, are the busiest roads in the project vicinity. In contrast, Phillip Road west of Fiddymment Road and west of the REP site have relatively little traffic since there is currently little development.

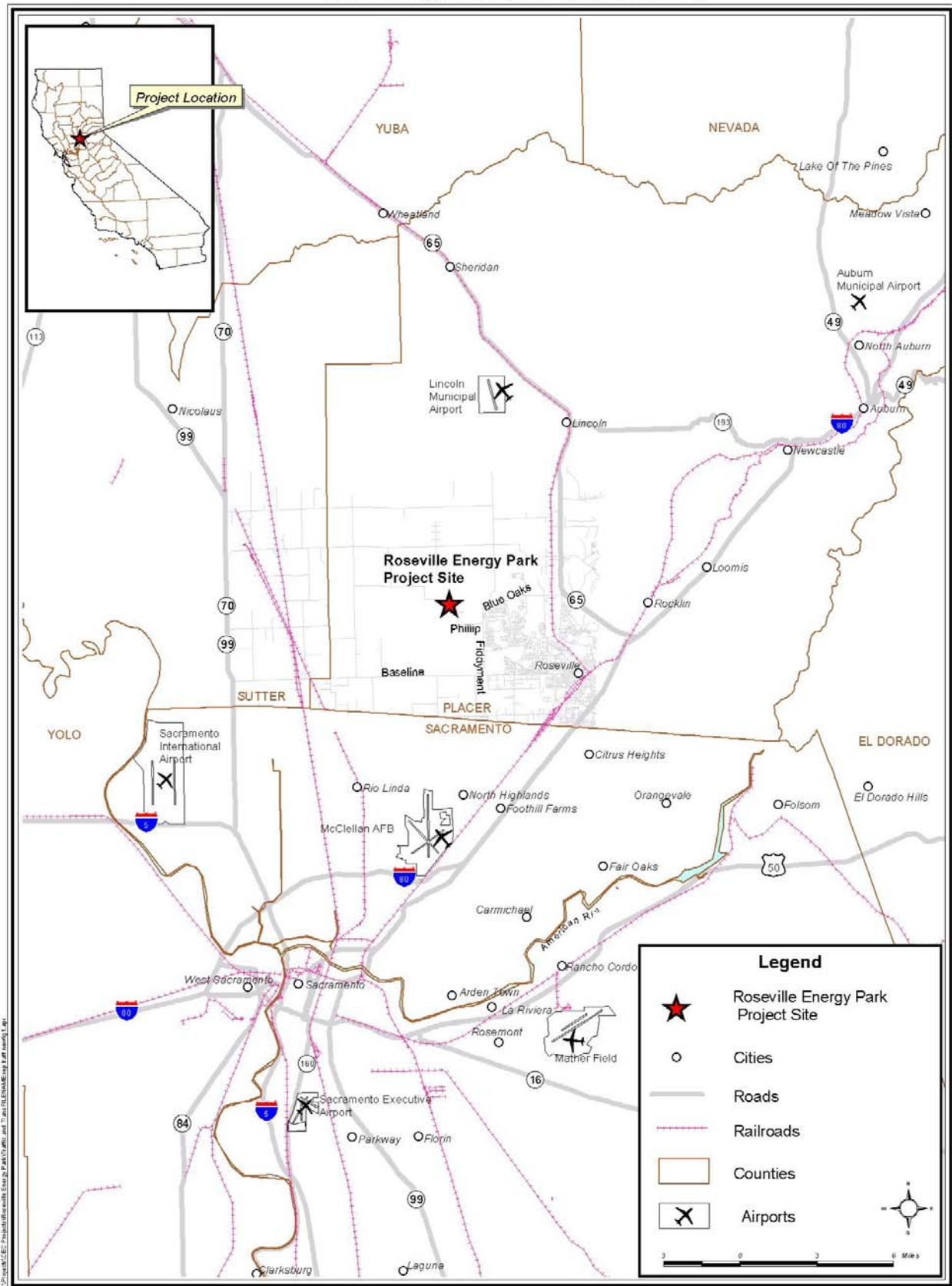
## **Accident History**

The California Highway Patrol's Statewide Integrated Traffic Records System provides a variety of information related to car accidents, including the type and number of accidents, vehicles involved, and conditions that contributed to the accident. In 2000, (the last published data set) the average number of accidents in California at signalized suburban intersections per million vehicles was 0.58. A three-year collision history from April 1, 2001 to March 31, 2004 show that the average collision rate for roads in the local area of the proposed REP site ranges from 0.08 for the intersection of Woodcreek Oaks Boulevard and Blue Oaks Boulevard, to 0.85 for the intersection of Washington Boulevard and Blue Oaks Boulevard. Examples of other accident rates include 0.00 for the intersection of Phillip and Fiddymment Roads, and 0.27 for the intersection of Blue Oaks Boulevard and Fiddymment Road. (City of Roseville 2004d).

## **Railways**

The nearest rail lines are four miles to the east, which includes a major train switchyard, and additional rail lines six miles to the west.

TRAFFIC AND TRANSPORTATION - FIGURE 1  
Roseville Energy Park- Regional Transportation Setting



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2004  
SOURCE: California Energy Commission Statewide Transmission & Power Plant Maps 2004

## Public Transportation

As noted above, the use of the automobile has increased substantially in the past several years. To counter this trend, the City of Roseville's Circulation Element of the General Plan envisions policies and implementation measures to shift from the automobile to other forms of transportation. This will include car-pooling, transit and non-vehicular modes of travel such as bicycles (City of Roseville 1992). There are several bus routes within the City of Roseville that provide different types of services, schedules, and routes for transit users. Route M utilizes Pleasant Grove Boulevard west to Fiddymont Road and north to Del Webb Boulevard. The closest bus stop is over two miles east of the REP.

## Pedestrians and Bicycles

A majority of the roads in the area are well traveled and have sidewalks. Blue Oaks, Fiddymont, and Baseline Roads have sidewalks, and Blue Oaks and Fiddymont Roads have bike lanes. Several roads are scheduled for widening and improvements such as bike lanes. There are bike lanes on Pleasant Grove Boulevard and Baseline Road.

## Trucks

The Transportation Element of the Placer County General Plan does not specifically detail size and weight/load limits for any roadways in the county, including those that would be used by large or heavily loaded trucks. Therefore, all applicable regulations are found in the California Vehicle Code. Some notable limits are 20,000 pounds per axle and 10,500 per wheel or wheels on one end of the axle. The Circulation Element of the General Plan has a policy of maintaining a system of truck routes to provide for the safe and efficient movement of goods and to avoid impacting residential neighborhoods (City of Roseville 1992).

## Airports

The REP site is located approximately 10 miles south of the Lincoln Airport located along SR-65, and is about 20 miles southwest of the Auburn Airport which is located near the junction of Sr-49 and I-80. The largest aviation facility in the general area is the Sacramento International Airport located 25 miles southwest of the REP site along I-5. FAA Form 7460-1 would not be required since the plant would not be within an airport control zone, which is generally within a five-mile radius (FAA 2002). For airports with runways longer than 3,200 feet, the restricted space extends 20,000 feet (3.3 nautical miles<sup>1</sup> from the runway).

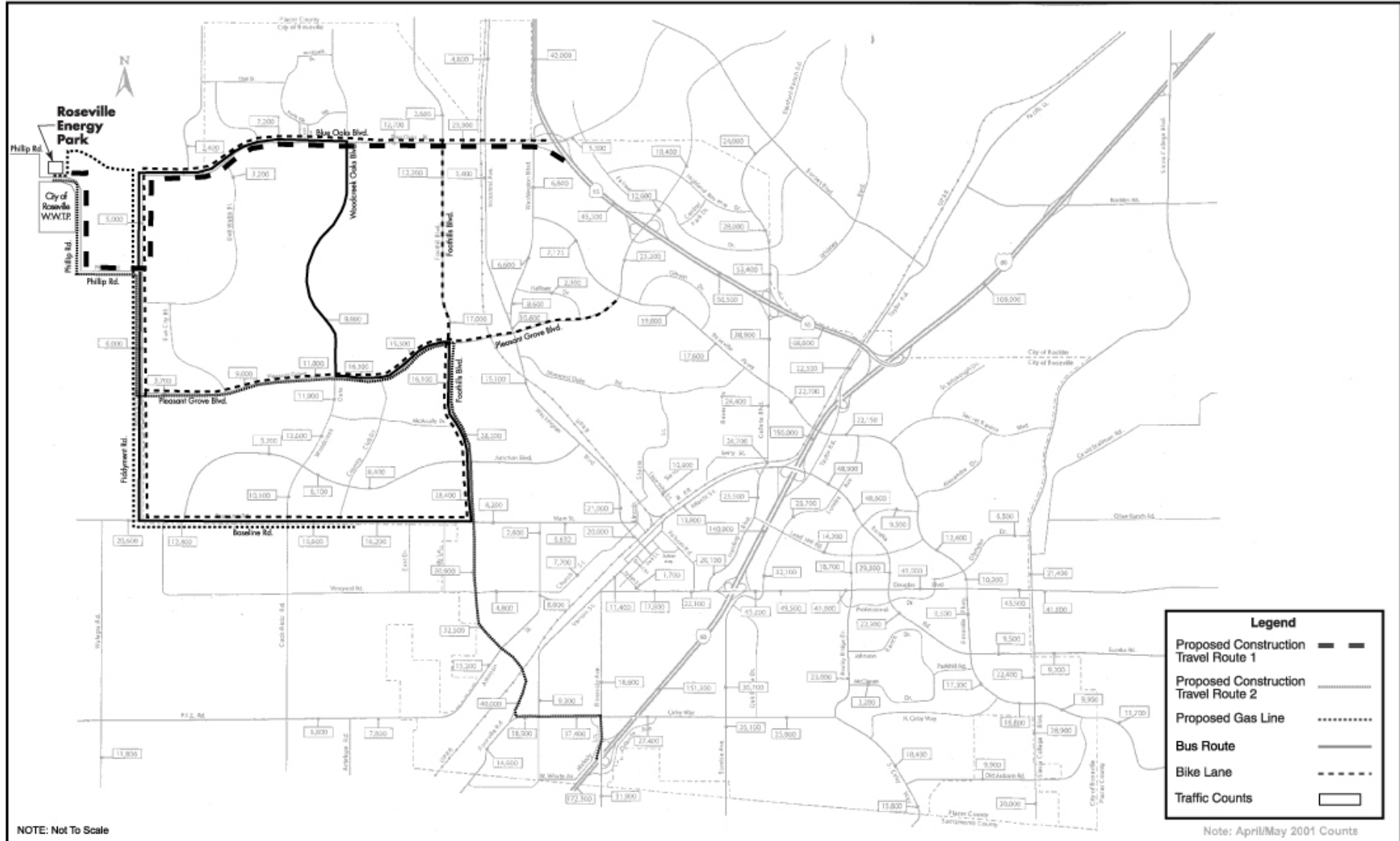
## CURRENT ROADWAY AND INTERSECTION OPERATING CONDITIONS

When evaluating a local transportation system, staff uses levels of service (LOS) measurements as the foundation on which to base its analysis. LOS measurements represent the flow of traffic. In general, LOS range from "A" with free flowing traffic, to "F," which is heavily congested with flow stopping frequently. The City General Plan set the performance standards for intersections at LOS C. **Traffic and Transportation** **Figure 1** displays existing LOS levels for the sections of roads in the REP vicinity based on average daily traffic and peak hour volume. Both Pleasant Grove Boulevard and

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<sup>1</sup> A nautical mile contains 6,076 feet, whereas a linear mile contains 5,280 feet.

**TRAFFIC AND TRANSPORTATION - FIGURE 2**  
 Roseville Energy Park - Traffic Counts, Potential Construction Worker Routes, Gas Line, Bus Routes and Bike Lanes



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2004  
 SOURCE: EIR for the West Roseville Specific Plan - Volume 1 - Figure 4.3-2

**TRAFFIC AND TRANSPORTATION - TABLE 1**  
Roseville Energy Park - Existing and REP Traffic Characteristics of Local Roads in the Project Area

JUNE 2004	Road or Highway	Existing Traffic		Capacities		Existing + Project
		AADT	Peak Hour Traffic	AADT	Peak Hour Traffic	AADT + REP Traffic (LOS)
TRAFFIC AND TRANSPORTATION	SR 65 (4-lane expressway) Harding Blvd. To Washington Blvd.	36,000(1)	4,450(1)	80,000	7,200	36,232(A)
	SR 99 (4-lane expressway) Baseline Road to Highway 70 Junction	23,700(1)	2,300(1)	80,000	7,200	23,932(A)
	Baseline Road (4-lane Arterial) East of Fiddymment Road	12,788(2)	1,667(2)	36,000	3,400	13,020(A)
	Brewer Road (2-lane County collector) West of REP Site	551(3)	55(3)	15,000	3,000	783(A)
	Fiddymment Road (2-lane arterial) North of Baseline Road	8,766(2)	897(2)	18,000	3,400	8,998(A)
	Phillip Road (2-lane County collector) West of Fiddymment Road	157(3)	6(3)	15,000	3,000	389(A)
	West of REP site	45(3)	3(3)	15,000	3,000	277(A)
	Blue Oaks Blvd. West of Woodcreek Oaks Blvd.	13,741(4)	1,268(4)	36,000	3,600	13,973(A)
	Pleasant Grove Blvd. West of Foothills Blvd.	27,760(4)	2,983(4)	36,000	3,600	27,992(C)*
	Foothills Blvd. South of Pleasant Grove Blvd.	30,991(4)	3,000(4)	36,000	3,600	31,223(D)
Sources: (1) URS 2001 (2) City of Roseville Traffic Count Database 2001 (3) Placer County 2003 (4) This number is Average Daily Traffic which City of Roseville Engineering staff advised CEC staff is equivalent to AADT. * Pleasant Grove Blvd. LOS at peak hour is D.						

Foothills Boulevard have a LOS level D during peak hours, and Foothills Boulevard has a LOS level D during off-peak hours as well.

## **PROJECT FEATURES**

The REP project includes the following features: a generating facility and switchyard at the site; a six-mile long natural gas pipeline; a 50-foot long recycled water pipeline, and a 800-foot long wastewater pipeline.

## **ANALYSIS AND IMPACTS**

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### **THRESHOLDS OF SIGNIFICANCE**

Significance criteria are based on California Environmental Quality Act (CEQA) Guidelines, the CEQA Environmental Checklist Form (amended December 1, 1999), and on performance standards or thresholds established by responsible agencies.

An impact may be considered significant if the project results in:

- an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);
- a level of service standard established by the county congestion management agency for designated roads or highways, is exceeded either individually or cumulatively;
- a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- a substantial increase in hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- inadequate emergency access;
- inadequate parking capacity; or
- a significant hazard to the public or the environment through the transportation of hazardous material.

### **CONSISTENCY WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS**

Public Resources Code section 25525 states that the Energy Commission shall not certify any facility when it finds "that the facility does not conform with any applicable state, local, or regional standards, ordinances, or laws, unless the [Energy] commission determines that such a facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving such public convenience and necessity. In making the determination, the Commission shall consider the entire record of the proceeding, including, but not limited to the impacts of the facility on the environment, consumer benefits, and electric system reliability." In no event shall the Commission make any finding in conflict with applicable federal law or regulation.



When determining if a project is in conformance with state, local or regional ordinances or regulations, the Energy Commission typically meets and consults with applicable agencies to determine conformity and, when necessary, "to attempt to correct or eliminate any noncompliance" (Pub. Resources Code § 25523(d)(1)). The traffic and transportation laws, ordinances, regulations, standards (LORS), and policies applicable to the project have been analyzed in the Impacts section below to determine the extent to which the REP is consistent or at variance with each requirement or standard.

## **IMPACTS**

The following discussion identifies potential traffic impacts associated with the construction of the REP, and provides an explanation of the impact conclusion.

### **Construction Phase**

Traffic impacts from the REP construction were evaluated based on daily and peak hour volumes. The peak month of construction activity was evaluated to provide a conservative (i.e. worst case) analysis. The peak period of construction is expected to occur 11 to 12 months after the start of construction.

#### **Construction Workforce and Truck Traffic**

For traffic impact analysis purposes, the applicant has assumed that construction workers in their vehicles will reach the REP site by using SR-65, Blue Oaks Boulevard, Fiddymment Road, and Phillip Road, or by using Pleasant Grove Boulevard to Fiddymment Road. Staff has also identified an additional likely route using I-80, Cirby Way, Baseline Road, Fiddymment Road, and Phillip Road. In addition, workers could arrive at the site using SR-99/70 via Baseline, Fiddymment, and Phillip Roads. Pleasant Grove Boulevard has a high level of congestion during peak commuting hours, and Foothills Boulevard has a high level of congestion all day long. Staff is recommending that Foothills be avoided altogether as a travel construction route, and Pleasant Grove will be avoided during peak commuting hours (see Condition of Certification **TRANS-1**).

The average construction workforce would be approximately 114, with a peak force of 206. The 18 to 20 month construction period is expected to last from the spring of 2005 to the fall of 2006. It is anticipated that 90 percent of the construction traffic will leave the site and head east on Phillip Road and then north on Fiddymment Road, and east on Blue Oaks Boulevard until reaching SR-65. Approximately 2 to 3 percent of the construction vehicles accessing the project site would be trucks. Blue Oaks Boulevard, Baseline and Fiddymment Roads are designated truck routes (Roseville 2003b, pg. S-55).

**Traffic and Transportation Table 2** below presents a summary of the estimated vehicle (i.e. cars and trucks) trip generation for the project construction phase. Assuming that 1/3 of the workers carpool, the proposed project will generate a total of 106 daily vehicle round trips, during an average construction month. For the peak months of heaviest construction activity (i.e. months 11 & 12), the REP will generate 145 round trips. This includes both construction worker commute traffic and truck traffic. Staff believes that car-pooling should be encouraged whenever possible, to minimize the number of daily vehicle trips. In addition, Condition of Certification **TRANS-1** requires the applicant to maximize the use of daily off-peak traffic periods for the arrival

and departure of construction traffic, to prevent deterioration from existing traffic conditions.

Construction traffic impacts to local and regional roads will be determined by the routes used by construction workers and delivery trucks arriving and departing from the project site. Most workers and deliveries of building supplies and equipment will come from the greater Sacramento Metropolitan Area.

### **Traffic and Transportation Table 2 Trip Generation Summary Table – Construction Phase**

#### Non-Peak Months

186 workers plus 26 trucks = 212 one way trips or 106 round trips

#### Peak Months (11 & 12)

278 workers plus 12 trucks = 290 one-way trips or 145 round trips

Adapted from REP AFC - Table 8.12-4

#### Notes:

1. REP assumes 1/3 of workers carpool (1.5 persons per vehicle)
2. REP assumes 80 percent of workers and 10 percent of deliveries arrive or depart during peak traffic hour
3. Staff assumes that there will be fewer trucks during the peak construction months because most of the materials and equipment will be on-site.

## **Railways**

During construction of the REP, the applicant plans on using the Southern Pacific rail line south of the project site or the rail line along Industrial Drive east of the project (REP 2003a, pg. 2-20) as shown in **Traffic and Transportation Figure 1**. The heavy haul truck route from the Union Pacific yard in Downtown Roseville utilizes Washington Road north to Blue Oaks Boulevard, west on Blue Oaks Boulevard to Fiddymment Road, south on Fiddymment Road to Phillip Road, and west on Phillip Road to the REP site (City of Roseville 2004b).

## **Linear Facilities**

Three related linear facilities will be constructed in conjunction with the REP: a natural gas pipeline and metering station, a recycled water line, and a wastewater discharge pipeline. **Traffic and Transportation Figure 2** shows the route of the gas pipeline. The construction of the gas and water pipelines would require deliveries of heavy equipment, construction materials and supplies, piping, concrete, rebar, miscellaneous consumables, and other construction equipment. There may be some minor impacts on adjacent roads (i.e. Phillip and Fiddymment Roads) such as temporary lane closures, detours, and traffic control procedures. Staff notes that parking will be made available on City-owned property onsite during construction of the REP (Roseville 2003a, Figure 2.2.2). Traffic implications of the linear facilities are discussed below.

### ***Natural Gas Pipeline***

**Traffic and Transportation** Figure 2 shows that the preferred route for the six-mile long natural gas pipeline begins at the southwest corner of the site and would proceed east to Phillip Road and north to Blue Oaks Boulevard. It would go east on the south side of Blue Oaks Boulevard until arriving at the intersection with Fiddymment Road. The pipeline would proceed south on the western side of Fiddymment Road and would cross Baseline Road. It would proceed east along the south side of Baseline Road until it connects with an existing pipeline approximately 700 feet east of the intersection of Baseline Road and Country Club Drive.

Construction of the pipeline is anticipated to take three months. Based on similar projects, it is estimated that a peak monthly workforce of approximately 12-14 employees will be required for pipeline and related facilities construction. Pipeline construction requires the use of heavy equipment including excavators (backhoe, loader, motor grader, and trencher), cranes, water trucks, and fuel trucks. Various equipment and material would be delivered by truck. There is a potential for some minor impacts on traffic using the roads along the pipeline route, such as a temporary detour, but these impacts would be less than significant. As noted earlier, staff is recommending in Condition of Certification **TRANS-1** that truck deliveries be made in off-peak periods.

### ***Recycled Water Line***

The 50-foot recycled water line will connect the REP and the Pleasant Grove Waste Water Treatment Plant (PGWWTP). The PGWWTP is under construction and will be operational within a year (City of Roseville 2004f). The recycled water line will cross underneath the current alignment of Phillip Road. Construction of the recycled water line would be completed within a couple of weeks. Traffic impacts on Phillip Road will be less than significant, particularly given the short length of the water line and the low number of vehicles using this section of the road.

### ***Wastewater Discharge Pipeline***

A new 800-foot waste water pipeline would be installed next to Phillip Road, from the REP site to the existing effluent junction at the PGWWTP. Staff expects the construction of the waste water discharge pipe would be completed within one to two months. There may be some traffic impacts on vehicles using Phillip Road similar to those identified in the discussion above on constructing the gas pipeline, but they will be less than significant.

### ***Changes to Level of Service***

The combination of commute, truck, and visitor traffic associated with the construction phase of the REP would increase the volume of traffic in the local area. With the project traffic measures described below, most of the roadway segments listed previously under existing conditions will remain at LOS A, with one remaining at C, as shown in the column on the right in **Traffic and Transportation Table 1**. However, Foothills Boulevard will remain at a LOS D level until the traffic signals are synchronized and the road is enlarged to six lanes within two years (City of Roseville 2004e). Staff is

recommending that construction workers and truck traffic use alternate roads such as Baseline Road and Blue Oaks Boulevard (see Condition of Certification **TRANS-1**).

Prior to plant construction, a traffic control plan (see Condition of Certification **TRANS-1**) will be developed and implemented so that traffic flow and access on local roads and intersections will not seriously degrade existing traffic patterns. The traffic control plan will outline what measures will need to be taken on a month-to-month basis, given the expected construction traffic volumes. The construction contractor will be required to prepare this plan to address timing of heavy equipment and building materials deliveries; an employee ridesharing/trip reduction plan; and signing, lighting, and traffic control device placement.

Best management practices will be incorporated in the construction traffic control plan, including:

- truck loads will not exceed legal limits;
- loads of material (i.e. excavated soil) will be centered in the cargo bed and either enclosed by vehicle covers or wetted to prevent wind from blowing materials out of the truck;
- trucks and trailers will be swept cleaned or hosed after unloading and before entering highway;
- mufflers, brakes, and all loose items on trucks will be maintained to minimize noise and ensure safe operation; and
- truck operations will be kept to quietest operating speeds. Drivers will be advised to avoid downshifting during vehicle operations through residential communities.

REP construction traffic could be easily accommodated on the various routes discussed earlier. Therefore, they will not be affected significantly.

### ***Roadway Size and Weight Limits***

Occasional transportation of large project components such as the generator turbines may exceed the load size and weight limits of regional and local roadways. Oversize and/or overweight loads will require Overload Limit Permits from Caltrans. Mitigation measures and a condition of certification (see Condition of Certification **TRANS-2**) that ensure compliance are discussed later in the Conditions section of this analysis.

## **OPERATIONAL PHASE**

### **Workforce and Visitor Traffic**

The operation of the REP would require a labor force of approximately 25 full-time employees with a maximum of 35 round-trips per day. This includes 25 round-trips by employees and 10 round-trips by trades people, vendors, consultants, and City of Roseville management personnel (Roseville 2003a, pg. 8.12-16). The existing highways and streets can easily accommodate this increase. No significant long-term traffic impacts are expected as a result of the REP's operational workforce and visitor traffic.

## **Truck Traffic**

During operation of the REP, trucks would periodically deliver/pickup replacement parts, lubricants, aqueous ammonia, sulfuric acid, refuse, and various disposable goods. On average there would be three truck deliveries (round trips) to the project site per day (Roseville 2003a, pg. 8.12-16). The anticipated travel route for materials delivery is the Blue Oaks Boulevard, Fiddymont and Phillip Roads route.

The existing highway and roadway system would not be significantly affected by the increase in truck traffic associated with the operation of the REP. Potential impacts of the transportation of hazardous substances can be mitigated to insignificance by compliance with Federal and State standards established to regulate the transportation of hazardous substances. Mitigation measures and conditions of certification that ensure this compliance are discussed later in this analysis.

## **Change in Air Traffic Patterns**

The Lincoln Airport, which is located 10 miles north, is the closest airport to the REP site. As noted above in the LORS and setting descriptions, the Federal Aviation Administration (FAA) Regulations, Part 77 establishes standards for determining if a structure could endanger airport operations. Since the REP is outside the Lincoln Airport control zone, the applicant is not required to file FAA Form 7460-1. Similarly, an aviation easement from the Placer County Airport Land Use Commission (PCALUC) is not required. In addition, staff believes that plumes generated by the REP would not create an aviation safety hazard, and the REP will not result in a change in air traffic patterns, or constitute any hazard to air traffic safety.

## **Hazards Posed by Design Feature or Incompatible Use**

Staff believes there may be a potential for cooling tower plumes forming ground fog that could reduce visibility in the winter for motorists using Phillip Road and Blue Oaks Boulevard. Phillip Road is expected to have very little traffic during the REP's operational phase, while a new section of Blue Oaks will eventually be an arterial with much higher traffic volumes (22,000 average daily traffic counts within 4,000 feet of the REP). With respect to the cooling tower plumes, under certain conditions (e.g., south winds during cold weather), the plumes could approach the new section of Blue Oaks. The potential for plume-related traffic safety hazards on this future extension of the road is unknown at this time but staff will perform a fogging analysis which will be discussed in the FSA.

The possibility of REP plume interaction with ground fog or steam originating from the waste water treatment plant ponds was also considered. Staff discussed these possibilities with the assistant plant manager for Sacramento Municipal Utility District's (SMUD) Carson Ice-Gen cogeneration facility, which is located adjacent to a wastewater treatment plant north of Elk Grove in southern Sacramento County (Sacramento Municipal Utility District, 2004). SMUD staff has not observed any instances of plumes from the power plant leading to ground fog formation, nor interaction with seasonal tule fog, or steam rising from the wastewater treatment ponds. From a mechanical perspective, the plume originates well above ground level, and has sufficient velocity that it is usually sent upward rather than towards the wastewater

plant. Staff has concluded that there is no impact related to the proximity of the generation facility plumes and the wastewater treatment plant's seasonal fog and steam formation.

### **Emergency Access**

Emergency vehicles would enter through the plant's main entrance on Phillip Road or a secondary entrance on the eastern side of the project site. All of the surrounding roadways currently operate and should continue to operate at LOS A or B. Emergency vehicles such as fire trucks and ambulances could approach the site from the east via Blue Oaks Boulevard and Fiddymment Road, and from the south via Baseline and Fiddymment Roads. The closest fire station is Fire Station #5 located at 1567 Pleasant Grove Boulevard approximately 3.8 miles from the REP (REP 2003a, pg. 2-23). Staff believes that an eight to ten minute emergency response time is a reasonable estimate. The nearest medical facility is the Sutter Roseville Medical Center located at One Medical Plaza, about nine miles east of the project site, with a response time of about twenty minutes (Roseville 2003a, pg. 8.10-6). Medical evacuation by helicopter from UC Davis Medical Center on Stockton Boulevard in Sacramento would have an approximately fifteen minute response time. Staff has concluded that the REP would not affect or constrain emergency access; therefore, no impact is expected.

### **Parking**

The applicant has stated that all parking needs for the construction workforce and construction related trucks will be provided onsite in an area west of the power plant footprint, in a space approximately 600 feet by 250 feet [150,000 sq. ft.] (Roseville 2003, pg. 2-1, Figure 2.2-2). Staff believes that this space will be adequate.

### **Transportation of Hazardous Material**

Operation of the REP will involve hazardous materials and waste including lubricants, aqueous ammonia, and sulfuric acid. Licensed hazardous waste transporters will access the REP via SR-65, Blue Oaks Boulevard, and Fiddymment and Phillip Roads.

The transportation and handling of hazardous substances associated with the REP can increase roadway hazard potential. The handling and disposal of hazardous substances are addressed in the **WASTE MANAGEMENT** and the **HAZARDOUS MATERIALS MANAGEMENT** sections of this Staff Assessment. Potential impacts of the transportation of hazardous substances can be mitigated to insignificance by compliance with federal and state standards established to regulate the transportation of hazardous substances. Condition of Certification **TRANS-4** addresses compliance with these regulations.

The State Department of Motor Vehicles specifically licenses all drivers who carry hazardous materials. Drivers are required to check for weight limits and conduct periodic brake inspections. Commercial truck operators handling hazardous materials are also required to take instruction in first aid and procedures on handling hazardous spills.

The California Vehicle Code and the Streets and Highways Code are equally important to ensure that the transportation and handling of hazardous materials are done in a

manner that protects public safety. Enforcement of these statutes is under the jurisdiction of the California Highway Patrol. For an in-depth description of the amount and type of hazardous materials that would be used during the construction of the facility, see the **WASTE MANAGEMENT** and **HAZARDOUS MATERIALS MANAGEMENT** sections of this Staff Assessment.

## **CUMULATIVE IMPACTS**

The REP is within the West Roseville Specific Plan (WRSP) area that will be undergoing substantial residential, commercial, and other development on a 3,162 acre parcel of land. The WRSP is discussed in detail in the **LAND USE** portion of this Staff Assessment. Initial earth moving activities related to WRSP development may begin in the spring of 2005. Construction of the REP is scheduled to start during the same time period.

Part of the WRSP development will entail a number of improvements and realignments of existing roads as well as construction of new roads. Some of these improvements will occur on roads that will be utilized by REP construction workers. The section of Blue Oaks Boulevard between Crocker Ranch Road and Fiddymont Road will be expanded to six lanes in 2006. The section of Fiddymont Road between Blue Oaks Boulevard and Pleasant Grove Boulevard will be enlarged to four lanes sometime between 2004 and 2006. The portion of Phillip Road that currently provides access to the REP site will become a private road after the construction of new roads in the West Roseville area. This will occur in 2007 or 2008.

Construction of the REP is scheduled to start in the spring of 2005 and conclude in the fall of 2006. Therefore, there may be some overlap with the road improvements noted above. City of Roseville Public Works Department staff has advised staff that traffic flow will not be significantly impaired during the time when the road improvements are scheduled to take place. Staff concurs with this conclusion. In addition, the increased traffic generated by the REP project's construction during the same period will not have an adverse impact on the levels of service for the applicable roads (City of Roseville 2004c). The amount of traffic generation will diminish dramatically between the construction and operational phases and will not contribute significantly to background traffic.

## **FACILITY CLOSURE**

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The planned life of the generation facility is 30 years. Facility closure requirements are discussed in detail in the general conditions section of this Staff Assessment. At least 12 months prior to the proposed decommissioning, the applicant shall prepare a Closure Plan for submission to the Energy Commission for review and action. At the time of closure all then-applicable LORS will be identified and the closure plan will address how these LORS will be complied with. The effects of the REP closure on traffic and transportation would be similar to those discussed for the project itself. Closure would create traffic levels that are similar in intensity and duration to those expected during facility construction. The removal of waste and other materials would produce impacts from truck traffic.

## MITIGATION

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The applicant should implement the following traffic and transportation mitigation measures:

- Prepare a construction traffic control plan with input from the City of Roseville and County Placer County and Caltrans (Condition of Certification **TRANS-1**).
- Obtain and comply with all necessary encroachment and transportation permits from Caltrans, and the City of Roseville and County Placer County, and other jurisdictions regarding the transportation of heavy equipment and hazardous materials and any construction activity within the public right-of-way (Conditions of Certification **TRANS-2, 3 & 4**).
- Enforce a policy that all project-related parking occurs in designated parking areas on the REP site (Condition of Certification **TRANS-5**).
- Repair any damage to Phillip and Fiddymont Roads, Pleasant Grove and Blue Oaks Boulevards, Baseline Road or other impacted roadway incurred during REP construction to the roads' pre-project construction condition (Condition of Certification **TRANS-6**).

## COMPLIANCE WITH LORS

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The applicant has stated its intention to comply with all federal, state and local LORS. Staff has recommended conditions of certification that will ensure compliance with identified federal, state, and local LORS, including the existing Placer County General Plan, the City of Roseville Transportation Element of the Comprehensive General Plan, and the West Roseville Specific Plan.

## CONCLUSIONS AND RECOMMENDATIONS

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1. During the construction phase, increased roadway demand resulting from the daily movement of workers and materials will slightly increase traffic on some roads that are currently rated LOS A, but this rating will not be significantly affected.
2. During the operational phase, increased roadway demand resulting from the daily movement of workers and materials will be negligible.
3. All potential impacts from the transportation and handling of hazardous substances can be mitigated to insignificance by compliance with federal, state, and local standards and permits established to regulate the transportation of hazardous substances.
4. The owner will obtain and comply with all necessary encroachment permits from Caltrans, and the City of Roseville, and the County of Placer County, and all other jurisdictions related to any construction within the public right-of-way.
5. Construction activities have the potential to damage local roadways. The applicant will be required to repair damaged roadways to their original condition.
6. The applicant indicates that parking for the construction workforce will be provided at the project site. The applicant will be required to enforce a policy that all project-



related parking occurs in designated parking areas; therefore, construction parking is not considered a significant project impact.

7. REP construction traffic (i.e. cars and trucks) should avoid using Foothills Boulevard.

The conditions of certification proposed below are those that staff has identified as necessary to mitigate project impacts and assure compliance with LORS. If the Energy Commission certifies the REP, staff recommends that it adopt the following Conditions of Certification.

## CONDITIONS OF CERTIFICATION

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**TRANS-1** The project owner shall develop a construction traffic control plan that limits peak hour construction-period truck and commute traffic in coordination with the City of Roseville Public Works Department. The project owner shall also consult with Placer County, Caltrans, and the City of Roseville staff dealing with traffic regulation enforcement. Specifically, the overall traffic control plan shall include the following:

- Require the primary contractor and major subcontractors to advise workers develop and implement a construction employee carpool program, and to avoid using Foothills Boulevard;
- Through worker education and shift scheduling, maximize worker commute trips during off-peak hours (off-peak hours are (1) before 6:00 AM; (2) between 9:00 AM and 4:00 PM; and (3) after 6:00 PM or other hours as agreed to by the CPM;
- Schedule heavy vehicle equipment and building material deliveries as well as the movement of materials and equipment to the site, including the adjacent lay-down area to occur during off-peak hours; and

The construction traffic control plan shall also include the following restrictions on construction traffic addressing the following issues for linear facilities:

- Timing of water and gas pipeline construction shall ensure that all pipeline construction affecting local roads shall take place outside the peak traffic periods to avoid traffic flow disruptions, or other hours as agreed to by the CPM;
- Signing, lighting, and traffic control device placement;
- Temporary travel lane closures and potential need for flagmen;
- Maintaining access to adjacent residential and commercial properties; and
- Emergency access.

**Verification:** At least 60 days prior to start of site mobilization, the project owner shall provide to Placer County, the City of Roseville, and the California Highway Patrol for review and comment, and to the CPM for review and approval, a copy of its construction traffic control plan.

**TRANS-2** The project owner shall comply with California Department of Transportation (Caltrans) and other affected jurisdictions' limitations on vehicle sizes and weights. In addition, the project owner or their contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for roadway use.

**Verification:** In the Monthly Compliance Reports, the project owner shall submit copies of any oversize and overweight transportation permits received during that reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

**TRANS-3** The project owner shall ensure compliance with Caltrans and other relevant jurisdictions' limitations for encroachment into public rights-of-way, and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.

**Verification:** In the Monthly Compliance Reports, the project owner shall submit copies of any encroachment permits received during that reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

**TRANS-4** The project owner shall ensure that permits and/or licenses are secured from the California Highway Patrol and Caltrans for the transport of all hazardous materials, and that all federal and state regulations for the transport of hazardous materials are observed.

**Verification:** The project owner shall include in its Monthly Compliance Reports during construction and Annual Compliance Reports during operations copies of all permits and licenses acquired by the project owner concerning the transport of hazardous materials.

**TRANS-5** Prior to the construction of the power plant and all related facilities, the project owner shall develop a parking and staging plan for all phases of project construction, to enforce a policy that all project related parking occurs onsite.

**Verification:** At least 30 days prior to the start of site mobilization, the project owner shall submit the plan to the City of Roseville Public Works staff for review and comment, and to the CPM for review and approval. The material submitted to the CPM shall include documentation of the City's review and comments. Monthly Compliance Reports submitted to the CPM shall describe the project owner's actions to ensure that this condition is being met.

**TRANS-6** Prior to the beginning of site mobilization activities, the project owner shall prepare a road mitigation plan for any roads affected by oversize or overweight vehicles and underground pipeline construction to the City of Roseville Public Works Department, and the CPM. The intent of this plan is to ensure that any roads affected by oversize or overweight vehicles and underground pipeline construction will be repaired and reconstructed to original or as near original condition as possible. This plan shall:

- Document the pre-construction condition of the affected roads in the region of the site (i.e., Phillip Road and Fiddymment Road) and those along a pipeline route (i.e., Phillip Road, Blue Oaks Boulevard, Fiddymment Road, Baseline Road). Prior to the start of site mobilization, the project owner shall provide to the CPM photographs or videotape of the affected roads.
- Document any portions of roads that may be inadequate to accommodate oversize or large construction vehicles, and complete remediation measures that are necessary;
- Provide appropriate bonding or other assurances to ensure that any damage to a road due to construction activity will be remedied by the project owner;
- Relocate utility poles if necessary, to insure that adequate clear zones are established along the property frontage; and
- Reconstruct portions of roads that are affected by project construction including the use of oversize or overweight construction vehicles, and the installation of underground utilities.

**Verification:** At least 90 days prior to the start of site mobilization, the project owner shall submit a road mitigation plan focused on restoring the roads to their pre-project condition to Placer County and the City of Roseville for review and comment, and to the CPM for review and approval.

At least 90 days prior to the start of pipeline construction, the project owner shall submit a separate road mitigation plan to the City of Roseville Public Works Department for review and comment and to the CPM for review and approval at least 30 days prior to the start of site mobilization.

Within 90 days following the completion of construction, the project owner shall provide photo/videotape documentation to the City of Roseville Public Works Department, and the CPM that the affected roads have been restored to their pre-project condition, consistent with local LORS.

## REFERENCES

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City of Roseville, 1992. Circulation Element of the General Plan of the City of Roseville.

City of Roseville, 2003. Transportation and Circulation Section, Environmental Impact Report for the West Roseville Specific Plan and Sphere of Influence Amendment, dated September 15, 2003.

City of Roseville 2004a. City of Roseville Existing and Proposed Bikeways. Revised March 2004.

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City of Roseville, 2004c. E-mail from Rob Jensen, Public Works Director/City Engineer, to James Adams, dated April 22, 2004.

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City of Roseville, 2004e. Personal communication with Susannah Altonan, Traffic Engineer, City of Roseville, and James Adams, on April 28, 2004.

City of Roseville, 2004f. Personal communication with Kelly Wickline, Environmental Utilities Division, City of Roseville, and James Adams, on April 29, 2004.

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# **TRANSMISSION LINE SAFETY AND NUISANCE**

Obed Odoemelam, Ph.D.

## **INTRODUCTION**

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The electrical energy from the proposed Roseville Electric (RE) power facility (Roseville Energy Park or REP), would be delivered to the City of Roseville's transmission grid through a new double-circuit 60 kV overhead line to be built by RE under the City's West Roseville Specific Plan (WRSP). The connection to the WRSP-related line would be through a new switchyard to be built at the REP site. The applicant, RE, would design, build, and maintain the connection line according to standards and practices currently applied to its existing utility lines. Since the WRSP-related 60 kV line would be located within the RE service area, it would be designed, built, and operated according to these same RE standards and practices (Roseville 2003a, pp. 1-2, and 6-10 through 6-12).

The purpose of this staff analysis is to assess the proposed interconnection line's construction and operation plan for incorporation of the measures necessary to minimize the related field and non-field impacts whose reduction remains the focus of the current laws, ordinances, regulations, and standards (LORS). If such compliance were established, staff would recommend approval with respect to the issues of concern in this analysis; if not, staff would recommend revisions as appropriate. Staff's analysis focuses on the following issues as related primarily to the physical presence of the lines, or secondarily, to the physical interactions of their electric and magnetic fields:

- aviation safety;
- interference with radio-frequency communication;
- audible noise;
- fire hazards;
- hazardous shocks;
- nuisance shocks; and
- electric and magnetic field (EMF) exposure.

## **LAWS, ORDINANCES, REGULATIONS AND STANDARDS**

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Discussed below by subject area are design-related LORS applicable to the physical impacts of the overhead transmission lines as proposed to connect the proposed REP with the WRSP-related 60 kV line. The potential for these impacts is assessed in terms of compliance with specific federal or state regulations or established industry standards and practices. There presently are no local laws or regulations specifically aimed at the physical structure or dimensions of electric power lines to limit the impacts noted above. However, many local jurisdictions require such lines to be located underground in new housing developments because of the potential for visual impacts on the landscape. Such requirements are not related to the concern over health effects.

## **AVIATION SAFETY**

Any potential hazard to area aircraft would relate to the potential for collision in the navigable air space. The applicable federal LORS, as discussed below, are intended to ensure the distance and visibility necessary to prevent such collisions.

### **Federal**

- Title 14, Part 77 of the Federal Code of Regulations (CFR), “Objects Affecting the Navigation Space.” Provisions of these regulations specify the criteria used by the Federal Aviation Administration (FAA) for determining whether a “Notice of Proposed Construction or Alteration” is required for potential obstruction hazards. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved. Such notification allows the FAA to ensure that the structure is located to avoid the aviation hazards of concern.
- FAA Advisory Circular (AC) No. 70/460-2H, “Proposed Construction and or Alteration of Objects that May Affect the Navigation Space.” This circular informs each proponent of a project that could pose an aviation hazard of the need to file the “Notice of Proposed Construction or Alteration” (Form 7640) with the FAA.
- FAA AC No. 70/460-1G, “Obstruction Marking and Lighting.” This circular describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.

## **INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION**

Transmission line-related radio-frequency interference is one of the indirect effects of line operation and is produced by the physical interactions of line electric fields. Such interference is due to the radio noise produced by the action of the electric fields on the surface of the energized conductor. The process involved is known as corona discharge, but is referred to as spark gap electric discharge when it occurs within gaps between the conductor and insulators or metal fittings. When generated, such noise manifests itself as perceivable interference with radio or television signal reception or interference with other forms of radio communication. Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines.

Electric fields are unable to penetrate most materials, including the soil, therefore, such interference and other electric field effects are not associated with underground lines. The level of any such interference usually depends on the magnitude of the electric fields involved. Because of this, the potential for perception could be assessed from considering the field strength estimates obtained for the line. The following regulations are intended to ensure that such lines are located away from areas of potential interference and that any interference is mitigated whenever it occurs.

## **Federal**

- Federal Communications Commission (FCC) regulations are specified in Title 47 CFR, Section 15.25. Provisions of these regulations prohibit operation of any devices producing force fields, which interfere with radio communications, even if (as with transmission lines) such devices are not intentionally designed to produce radio-frequency energy. The FCC requires each line operator to mitigate all complaints about interference on a case-specific basis. Staff recommends specific conditions of certification as necessary to ensure compliance with this FCC requirement.

## **State**

- California Public Utilities Commission (CPUC), General Order 52 (GO-52), governs the construction and operation of power and communications lines to prevent or mitigate inductive interference.

Several design and maintenance options are available for minimizing these electric field-related impacts. When incorporated into the line design and operation, such measures also serve to reduce the line-related audible noise discussed below.

## **AUDIBLE NOISE**

### **Industry Standards**

There are no design-specific federal or state regulations to limit the audible noise from transmission lines. As with radio noise, such noise is limited through design, construction or maintenance practices established from industry research and experience as effective without significant impacts on line safety, efficiency maintainability and reliability. All modern overhead high-voltage lines are designed to assure compliance with such noise limits. As with radio-frequency noise, such audible noise usually results from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying or hissing sound or hum, especially in wet weather. Since the noise level depends on the strength of the line electric field, the potential for perception can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during rainfall, but mainly from overhead lines of 345 kV or higher. It is, therefore, not generally expected at significant levels from those of less than 345 kV as proposed for REP. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing the fair-weather audible noise from modern transmission lines to be generally indistinguishable from background noise at the edge of a 100-ft right-of-way.

## **FIRE HAZARDS**

The fire hazards addressed through the following regulations are those that could be caused by sparks from conductors of overhead lines, or that could result from direct contact between the line and nearby trees and other combustible objects.

## **State**

- CPUC, General Order 95 (GO-95), "Rules for Overhead Electric Line Construction," specifies tree-trimming criteria to minimize the potential for power line-related fires.

- Title 14, California Code of Regulations, Section 1250: “Fire Prevention Standards for Electric Utilities” specifies utility-related measures for fire prevention.

## **HAZARDOUS SHOCKS**

The hazardous shocks addressed by the following regulations and standards are those that could result from direct or indirect contact between an individual and the energized line whether overhead or underground. Such shocks are capable of serious physiological harm or death and remain a driving force in the design and operation of transmission and other high-voltage lines.

### **State**

- CPUC, GO-95, “Rules for Overhead Line Construction,” specify uniform statewide requirements for overhead line construction regarding ground clearance, grounding, maintenance and inspection. Implementing these requirements ensures the safety of the general public and line workers.
- Title 8, California Code of Regulations, Section 2700 et seq.: “High Voltage Electric Safety Orders,” establish essential requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment.

### **Industrial Standards**

No design-specific federal regulations have been established to prevent hazardous shocks from overhead power lines. Safety is assured within the industry from compliance with the requirements in the National Electrical Safety Code, Part 2: Safety Rules for Overhead Lines. These provisions specify the minimum national safe operating clearances applicable in areas where the line might be accessible to the public. They are intended to minimize the potential for direct or indirect contact with the energized line.

## **NUISANCE SHOCKS**

### **Industry Standards**

Nuisance shocks are caused by current flow at levels generally incapable of causing significant physiological harm. They result mostly from direct contact with metal objects electrically charged by fields from the energized line. Such electric charges are induced in different ways by the line electric and magnetic fields.

There are no design-specific federal or state regulations to limit nuisance shocks in the transmission line environment. For modern overhead high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code (NESC) and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). As with the proposed overhead lines, the applicant will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way. Staff recommends specific conditions of certification as necessary to ensure that such grounding is made along the proposed route.



## **ELECTRIC AND MAGNETIC FIELD (EMF) EXPOSURE**

The possibility of deleterious health effects from electric and magnetic field exposure has increased public concern in recent years about living near high-voltage lines. Both fields occur together whenever electricity flows, hence the general practice of describing exposure to them together as EMF exposure. The available evidence as evaluated by CPUC, other regulatory agencies, and staff, has not established that such fields pose a significant health hazard to exposed humans. However, staff considers it important, as does the CPUC, to note that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Staff, therefore, considers it appropriate in light of present uncertainty, to recommend reduction of such fields as feasible without affecting safety, efficiency, reliability and maintainability.

While there is considerable uncertainty about EMF health effects, the following facts have been established from the available information and have been used to establish existing policies:

- Any exposure-related health risk to the exposed individual will likely be small.
- The most biologically significant types of exposures have not been established.
- Most health concerns are about the magnetic field.
- The measures employed for such field reduction can affect line safety, reliability, efficiency, and maintainability, depending on the type and extent of such measures.

### **State**

In California, the CPUC (which regulates the installation and operation of high-voltage lines in California) has determined that only no-cost or low-cost measures are presently justified in any effort to reduce power line fields beyond levels existing before the present health concern arose. The CPUC has further determined that such reduction should be made only in connection with new or modified lines. It requires each utility within its jurisdiction to establish EMF-reducing measures and incorporate such measures into the designs for all new or upgraded power lines and related facilities within their respective service areas. The CPUC further established specific limits on the resources to be used in each case for field reduction. Such limitations were intended by the CPUC to apply to the cost of any redesign to reduce field strength or relocation to reduce exposure. Utilities, such as Roseville Energy, which are not within the jurisdiction of the CPUC, voluntarily comply with these CPUC requirements. This CPUC policy resulted from assessments made to implement CPUC Decision 93-11-013.

In keeping with this CPUC policy, staff requires a showing that each proposed overhead line would be designed according to the EMF-reducing design guidelines applicable to the utility service area involved. These field-reducing measures can impact line operation if applied without appropriate regard for environmental and other local issues bearing on safety, reliability, efficiency, and maintainability. Therefore, it is up to each applicant to ensure that such measures are applied in ways that prevent significant impacts on line operation and safety. The extent of such applications would be reflected by the ground-level field strengths as measured during operation. When estimated or measured for lines of similar voltage and current-carrying capacity, such

field strength values can be used by staff and other regulatory agencies to assess the effectiveness of the applied reduction measures. These field strengths can be estimated for any given design using established procedures. Estimates are specified for a height of one meter above the ground, in units of kilovolts per meter (kV/m), for the electric field, and milligauss (mG) for the companion magnetic field. Their magnitude depends on line voltage (in the case of electric fields), the geometry of the support structures, degree of cancellation from nearby conductors, distance between conductors and, in the case of magnetic fields, amount of current in the line.

Since each new line in California is currently required by the CPUC to be designed according to the EMF-reducing guidelines of the electric utility in the service area involved, its fields are required under this CPUC policy to be similar to fields from similar lines in that service area. Designing the proposed REP connection line according to existing RE field strength-reducing guidelines would constitute compliance with the CPUC requirements for line field management. Staff recommends a specific condition of certification (**TLSN-1**) to ensure implementation of the design measures necessary.

### **Industrial Standards**

There are no health-based federal regulations or industry codes specifying environmental limits on the strengths of fields from power lines. However, the federal government continues to conduct and encourage research necessary for an appropriate policy on the EMF health issue.

In the face of the present uncertainty, several states have opted for design-driven regulations ensuring that fields from new lines are generally similar to those from existing lines. Some states (Florida, Minnesota, New Jersey, New York, Montana) have set specific environmental limits on one or both fields in this regard. These limits are, however, not based on any specific health effects. Most regulatory agencies believe, as does staff, that health-based limits are inappropriate at this time. They also believe that the present knowledge of the issue does not justify any retrofit of existing lines.

Before the present health-based concern developed, measures to reduce field effects from power line operations were mostly aimed at the electric field component whose effects can manifest themselves as the previously noted radio noise, audible noise and nuisance shocks. The present focus is on the magnetic field because only it can penetrate soil, building and other materials to potentially produce the types of health impacts at the root of the present concern. As one focuses on the strong magnetic fields from the more visible overhead transmission and other high-voltage power lines, staff considers it important, for perspective, to note that an individual in a home could be exposed to much stronger fields while using some common household appliances (National Institute of Environmental Health Services and the U.S Department of Energy, 1995). The difference between these types of field exposures is that the higher-level, appliance-related exposures are short-term, while the exposure from power lines are lower level, but long-term. Scientists have not established which of these types of exposures would be more biologically meaningful in the individual. Staff notes such exposure differences only to show that high-level magnetic field exposures regularly occur in areas other than around high-voltage power lines.

## SETTING

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According to information from the applicant (Roseville 2003a, pp. 1-1, 6-1, 6-2, 8.6-1 through 8.6-8, and pp. 8.6-13 and 8.6-14), the proposed REP would be located on a 12-acre site within a 40-acre land parcel owned by the City of Roseville. The site is adjacent to and north of the Pleasant Grove Wastewater Treatment Plant in an area currently utilized for agricultural grazing and with only a few rural residences the nearest of which is 850 feet to the northwest. While the area to the south, east, and west are proposed for residential, industrial and commercial development under the West Roseville Specific Plan, there would be no residences in the immediate vicinity of the proposed REP and interconnection line, as well as the WRSP-related 60 kV transmission line to which it will be interconnected. The proposed connecting line would be approximately 100 feet long and located entirely within REP's property boundaries, meaning that the residential magnetic field exposure at the root of the present health concern would be insignificant for this project line. The only project-related EMF exposures of potential significance are the short-term exposures of plant workers, regulatory inspectors, maintenance personnel, visitors, or individuals in transit under the project's lines. These types of exposures are short term and well understood as not significantly related to the present health concern. The same lack of nearby residences means that the previously noted electric field-related communication impacts would be unlikely from operations.

## PROJECT DESCRIPTION

The proposed REP line will consist of the segments listed below:

- One double-circuit overhead 60 kV line extending approximately 100 feet from the project's 60 kV switchyard to the connection point on the WRSP-related 60 kV line extending to RE's Fiddymont Receiving Station approximately 4 miles to the south; and
- The project's on-site 60 kV switchyard.

The interconnection scheme would constitute a looping of the interconnected line from the point of connection to the WRSP-related line, into the new on-site project 60 kV switchyard. The basic configuration of the line's support structures was provided by the applicant as relevant to safety, efficiency, reliability, and field cancellation effectiveness.

Since the proposed interconnection line would be designed and operated according to standard RE practices, its design-driven field strengths (and, therefore, potential contribution to existing area field levels) should be at the same level expected for RE lines of the same voltage and current-carrying capacity. Staff recommends a specific condition of certification (**TLSN-2**) to provide the data necessary for the required compliance assessment.

## IMPACTS

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### PROJECT SPECIFIC IMPACTS

#### **Aviation Safety**

As noted by the applicant (Roseville 2003a, p. 6-9) the structural support for the proposed line would (at less than 70 feet tall) be significantly shorter than the 200 feet regarded by the FAA as triggering the concern about aviation safety. Furthermore, the line would be located within REP's property boundaries in an area with existing lines of higher voltage and no nearby airports or heliports. Given these conditions, staff considers the proposed interconnection line as unlikely to pose a significant obstruction-related aviation hazard to utilizing aircraft as defined using current FAA criteria. Therefore, no FAA "Notice of Construction or Alteration" would be required.

#### **Interference with Radio-Frequency Communication**

The previously noted corona-related communications interference is most commonly caused by irregularities (such as nicks and scrapes on the conductor surface), sharp edges on suspension hardware, and other discontinuities around the conductor surface. The proposed lines would be built and maintained according to standard RE practices, minimizing such surface irregularities and discontinuities (Roseville 2003a, p. 6-9). Moreover, the potential for such corona-related interference is usually of concern for lines of 345 kV and above, and not the proposed 60 kV, even in rainy weather when the presence of raindrops increases the strengths of the offending surface electric fields. The intended low-corona design would be the same as used for existing RE lines of similar voltage rating. Since these existing lines do not currently produce the corona effects of specific concern, staff does not expect any corona-related radio-frequency interference in the area around the line. Moreover, the line would be located within the REP property lines in an area without residences making it unnecessary to recommend a specific condition on the issue of residential radio or television signal interference.

#### **Audible Noise**

As happens with radio noise, the low-corona design to be used for the proposed REP lines would serve to minimize the potential for corona-related audible noise. This means, as noted by the applicant (Roseville 2003a, p. 6-8), that the proposed line operation would be unlikely to add significantly to current background noise levels in the project area. For an assessment of the noise from all phases of the proposed project and related facilities, please refer to staff's analysis in the **Noise and Vibration** section of this Preliminary Staff Assessment.

#### **Fire Hazards**

Standard fire prevention and suppression measures for all RE lines would be implemented for the proposed interconnection line (Roseville 2003a, p. 6-9). The applicant's intention to ensure compliance with the clearance-related aspects of GO-95 would be an important part of this compliance approach. Moreover, the line would be located within REP's property lines without the trees that could pose a fire hazard from line contact.

## **Hazardous Shocks**

The applicant's stated intention to implement the GO-95- related measures against direct contact with the energized line (Roseville 2003a, pp. 6-7, 6-8 and 6-10) would serve to minimize the risk of hazardous shocks. Staff's recommended condition of certification (**TLSN-1**) would be adequate to ensure implementation of the necessary mitigation measures.

## **Nuisance Shocks**

The potential for nuisance shocks around the proposed line would be minimized through standard industry grounding practices (Roseville 2003a, pp. 6-8 and 6-9). Staff recommends Condition of Certification **TLSN-2** to ensure such grounding.

## **Electric and magnetic field exposure**

As noted by the applicant (Roseville 2003a, p. 6-7), specific field strength-reducing measures would be incorporated into the proposed connecting line design to ensure the field strength minimization currently required by CPUC in light of the concern over EMF exposure and health.

The field reduction measures to be applied include the following:

1. Increasing the distance between the conductors and the ground;
2. Reducing the spacing between the conductors;
3. Minimizing the current in the line; and
4. Arranging current flow to maximize the cancellation effects from interacting of conductor fields.

Connecting the proposed REP line to the WRSP-related line of the same voltage would not change the existing voltages within the area transmission grid. Staff recommends specific field strength measurements in Condition of Certification **TLSN-3** to verify that the REP-related voltage would not change the existing electric fields without significant changes to the applied voltage. These measurements would also allow for comparison with electric fields from RE lines of the same design and voltage. The recommendation for magnetic field strength measurements would allow for comparison with magnetic fields from RE lines of the same design and current-carrying capacity as well as those from similar lines in the few states with specific limits on line magnetic fields. These magnetic field strength limits vary from 150 to 250 mG established (depending on voltage level) for the edges of the rights-of-way.

Since optimum field-reducing measures have been incorporated into the proposed line design, staff considers further mitigation to be unnecessary at this point, but would seek to validate the applicant's assumed reduction efficiency from the recommended field strength measurements.

## **CUMULATIVE IMPACTS**

Since the proposed REP-related transmission lines would be designed according to applicable field-reducing RE guidelines (as currently required by the CPUC for effective

field management), staff expects the resulting fields to be similar in intensity to fields from RE lines of the similar voltage and current-carrying capacity. Any contribution to cumulative area exposures would be at similar levels. It is this similarity in intensity that constitutes compliance with current CPUC requirements on EMF management. The actual field strengths and contribution levels for the proposed line design would be assessed from the results of the field strength measurements specified in Condition of Certification **TLSN-3**.

## **COMPLIANCE WITH LORS**

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As previously noted, current CPUC policy on safe EMF management requires that any high-voltage line within a given area be designed to incorporate the field strength-reducing guidelines of the main area utility, which for REP is Roseville Electric. Since the proposed connection lines would be designed according to the requirements of GO 95, GO 52, and Title 8, Section 2700 et seq. of the California Code of Regulations and operated and maintained according to current Roseville Electric guidelines on line safety and field strength management, staff considers the presented design and operational plan to be in compliance with the health and safety LORS of concern in this analysis. The actual contribution to the area's field exposure levels would be assessed from results of the field strength measurements required in Condition of Certification **TLSN-3**.

## **CONCLUSIONS AND RECOMMENDATIONS**

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### **CONCLUSIONS**

Since electric or magnetic field health effects have neither been established nor ruled out for overhead and underground lines, the public health significance of any REP-related field exposures cannot be characterized with certainty. The only conclusion to be reached with certainty is that the proposed line design and operational plan would be adequate to ensure that the generated electric and magnetic fields are managed to an extent CPUC considers appropriate in light of the available health effects information. The long-term, mostly residential magnetic exposure at the root of the present health concern would be insignificant for the proposed interconnection lines given the general absence of residences along the proposed route. On-site worker or public exposure would be short term and at levels expected for RE lines of similar designs and current-carrying capacity. Such exposure is well understood and has not been established as posing a significant human health hazard.

The potential for nuisance shocks would be minimized through grounding and other field-reducing measures to be implemented in keeping with current RE guidelines (reflecting standard industry practices). These field-reducing measures would maintain the generated fields within levels not associated with radio-frequency interference or audible noise. The potential for hazardous shocks would be minimized through compliance with the height and clearance requirements of General Order 95. Compliance with Title 14, California Code of Regulations, Section 1250, should be adequate to minimize any fire hazards. Since there are no major airports or aviation centers in the immediate project area, staff does not expect the proposed line to pose a significant aviation hazard. The use of low-corona line design, together with appropriate

corona-minimizing construction practices, minimizes the potential for corona noise and its related interference with radio-frequency communication in the area around the proposed route.

## **RECOMMENDATIONS**

Since the interconnecting REP 60 kV line would be designed to minimize the safety and nuisance impacts of specific concern to staff, and located at a site with no nearby residences, staff does not recommend further mitigation and recommends approval of the proposed design and operational plan. If such approval is granted, staff recommends that the Energy Commission adopt the conditions of certification specified below to ensure implementation of the measures necessary to achieve the field reduction and line safety assumed by the applicant.

## **CONDITIONS OF CERTIFICATION**

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**TLSN-1** The project owner shall provide specific evidence that the proposed interconnection transmission line will be designed and constructed by Roseville Electric according to the requirements of CPUC's GO-95, GO-52, Title 8, Section 2700 et seq. of the California Code of Regulations and RE's EMF reduction guidelines arising from CPUC Decision 93-11-013.

**Verification:** At least 30 days before starting construction of RE's transmission lines or related structures and facilities, the project owner shall submit to the CPM a letter from Roseville Electric affirming that the proposed REP line will be constructed according to the requirements of GO-95, GO-52, Title 8, Section 2700 et seq. of the California Code of Regulations, and RE's EMF-reduction guidelines arising from CPUC Decision 93-11-013.

**TLSN-2** The project owner shall provide specific evidence that all metallic objects along the route of the overhead section will be grounded according to RE's practices.

**Verification:** At least 30 days before the lines are energized, the project owner shall transmit to the CPM a letter confirming potential compliance with the specified grounding requirements.

**TLSN-3** The project owner shall provide the results of the electric and magnetic field measurements for the proposed REP line (as made according to IEEE measurement protocols) before and after it is energized. Measurements shall be made at representative points (along the line's on-site location) as necessary to identify the maximum field exposures possible during REP operations.

**Verification:** The project owner shall submit the field measurement results to the CPM within 60 days of completion.

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# **VISUAL RESOURCES**

Eric Knight

## **INTRODUCTION**

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Visual resources are the natural and man-made features of the environment that can be viewed. This analysis focuses on whether construction and operation of the Roseville Energy Park (REP) project would cause significant impacts to visual resources in the vicinity of the project, and whether the project would be in compliance with applicable laws, ordinances, regulations, and standards (LORS). This analysis complies with the California Environmental Quality Act (CEQA), which requires that government agencies make a determination of the potential for visual impacts resulting from a proposed project.

## **ORGANIZATION OF ANALYSIS**

This analysis is organized as follows:

- description of analysis methodology;
- description of applicable LORS;
- description of the project aspects that may have the potential for significant visual impacts;
- assessment of the visual setting of the proposed power plant site and linear facility routes;
- evaluation of the visual impacts of the proposed project on the existing setting;
- evaluation of the project's compliance with applicable LORS;
- identification of measures needed to mitigate any potential significant adverse impacts of the proposed project and/or to achieve compliance with applicable LORS; and
- conclusions and recommendations.

## **ANALYSIS METHODOLOGY**

Visual resources analysis has an inherently subjective aspect. However, the use of generally accepted criteria for determining impact significance and a clearly described analytical approach aid in developing an analysis that can be readily understood.

### **Significance Criteria**

Energy Commission staff considered the following criteria in determining whether a visual impact would be significant.

The CEQA Guidelines define a “significant effect” on the environment to mean a “substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including...objects of historic or aesthetic significance” (Cal. Code Regs., tit.14, § 15382).

Appendix G of the CEQA Guidelines, under Aesthetics, lists the following four questions to be addressed regarding whether the potential impacts of a project are significant.

1. Would the project have a substantial adverse effect on a scenic vista?
2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?
4. Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

## **Evaluation Process**

For the Visual Resources analysis, staff first examined the planning documents, such as General Plans and Specific Plans, applicable to the project area to gain insight as to the type of land uses intended for the area, and the guidelines given for the protection or preservation of visual resources. Staff then considered the existing visual setting within the project viewshed, which is defined as the geographical area in which the project can be seen. Staff estimated the visual changes that the project would cause to determine impact significance, following the four CEQA Guidelines checklist questions listed above. Please refer to **Appendix VR-1** at the end of this section of the Preliminary Staff Assessment (PSA) for a more complete description of staff's Visual Resources evaluation process.

Before beginning the analysis, staff first determined which parts of the project could create an impact to visual resources. In this case, both the power plant and the visible water vapor plumes it would produce could create an impact to visual resources. Staff examined potential impacts using a Key Observation Point (KOP) analysis, among other tools and information sources. Existing condition photographs, and visual simulations of those same views after project development, were prepared for each KOP.

KOPs were selected to be representative of the most sensitive locations from which the project would be seen, but they are not the only locations that staff considered in each view area. Before Roseville Electric (RE, or "applicant") filed its Application for Certification (AFC), staff visited the project area with RE's consultants for the purpose of selecting the KOPs. Two KOPs were selected for analysis: one to represent the view of local residents living very near the REP site, and another to represent the view of motorists traveling north and some residents living along Fiddymont Road, about 1.25 miles southeast of the project site.

Once all potential impacts are examined, staff makes the determination as to whether any impacts reach a significant level and thus require mitigation beyond that proposed by the applicant. Any required mitigation must be specific to an identified impact, and must be feasible.

## **LAWS, ORDINANCES, REGULATIONS, AND STANDARDS**

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### **FEDERAL**

The proposed project is not located on federally administered public lands and therefore is not subject to federal regulations pertaining to visual resources.

### **STATE**

There are no State Scenic Highways within the project viewshed. Therefore, no state regulations pertaining to scenic resources are applicable to the project.

### **LOCAL**

The proposed power plant and associated linear facilities (recycled water and natural gas supply pipelines, sanitary sewer pipeline, and storm water outfall) would be located within the city limits of the City of Roseville. Therefore, the project would be subject to local LORS pertaining to the protection and maintenance of visual resources, which are found in the City of Roseville General Plan and Community Development Guidelines. A portion of the natural gas supply pipeline would traverse lands currently within unincorporated Placer County. These lands, specifically the area west of Fiddymment Road, are located within the West Roseville Specific Plan (WRSP) area. The Roseville City Council has approved the WRSP, but the area has not been approved at this time for incorporation into the City of Roseville by the Placer County Local Agency Formation Commission. Staff did not identify any visual resources-related goals or policies in the Placer County General Plan that would apply to the gas supply pipeline. The project's consistency with local LORS is discussed later in this analysis.

## **PROJECT DESCRIPTION**

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The following section describes the aspects of the proposed project that may have the potential to cause adverse impacts to visual resources. Please refer to the **PROJECT DESCRIPTION** section of the PSA for a more complete discussion of project details.

### **POWER PLANT**

The major visible components of the power plant would include the two 120-foot tall heat recovery steam generator (HRSG) exhaust stacks, the two 53-foot tall and 93-foot long HRSG units, the two 35-foot tall (including the inlet air filters) and 57-foot long gas combustion turbine generators, a 45-foot tall steam turbine generator (including pedestal), and a 44-foot tall and 193-foot long four-cell cooling tower (Roseville 2003a). The project would also include an on-site zero liquid discharge (ZLD) system to process industrial wastewater. The most prominent features of the ZLD system are the two 80-foot tall brine concentrator stacks and the two 70-foot tall crystallizer stacks. The dimensions of the major components of the power plant structures are provided in AFC Tables 8.13-2 and 8.13-4.

The combustion turbines and generator housing, the HRSGs and exhaust stacks, and the cooling tower are proposed to be painted or treated in neutral gray colors to blend in with the sky. The switchyard structures would be galvanized metal to blend with the sky.

and the color of the power plant structures. The various buildings at the REP site – the administration/control building, warehouse/maintenance building, water treatment building, plant electrical building, and chemical feed building – are proposed to have off-white colored walls and light tan roofs to complement the major power plant structures and to blend with the golden colors of the surrounding grasslands (Roseville 2003a). The large storage tanks – the fire water, demineralized water, and cooling tower water blowdown storage tanks – would be grouped together and are proposed to be painted neutral gray colors. An eight-foot high chain-link fence would surround the power plant site.

## **LINEAR FACILITIES**

The REP would connect with a future 60 kV double-circuit transmission line along Phillip Road that was permitted as part of the WRSP. Immediately south of the REP switchyard, the 60 kV transmission line would be looped into the switchyard via short, new connector lines that would be less than 100 feet long and confined to the REP site (Roseville 2003a).

A 6.0-mile long pipeline (identified as “Route A” in the AFC) would be constructed to deliver natural gas to the project. The gas pipeline would originate at an existing PG&E gas distribution line near the corner of Baseline Road and Country Club Drive, east of the REP site. The line would travel west along Baseline Road and then turn north along Fiddymont Road. At Blue Oaks Boulevard, the line would turn west and continue along the route of the future extension of Blue Oaks Boulevard. The pipeline would turn south to follow the future alignment of Phillip Road and then turn west to follow along existing Phillip Road to the REP site, terminating at a gas metering station that would be constructed on the site.

The REP would require construction of several other pipelines. The power plant would use recycled water from the Pleasant Grove Waste Water Treatment Plant (PGWWTP) for cooling purposes. The recycled water pipeline would be very short in length because the PGWWTP is located immediately south of the REP site. It would cross underneath Phillip Road and would be located entirely underground. A sanitary sewer pipeline would run east for about 800 feet along Phillip Road to the PGWWTP influent junction structure. The sanitary sewer pipeline would also be constructed entirely underground. A storm water outfall would run east to northeast for about 340 feet to an unnamed tributary to Pleasant Grove Creek. The western portion of the outfall would be a pipeline and the eastern portion would be an open ditch.

## **CONSTRUCTION LAYDOWN AREAS**

The proposed project would be situated within a 40-acre property located on Phillip Road immediately north of the PGWWTP. The power plant and electrical switchyard would occupy approximately nine acres of this property, while the remaining areas of the property (to the west, north, and east of the REP site) would be used during project construction for storage of equipment and materials and for parking by construction personnel (Roseville 2003a). Construction of the proposed power plant and associated facilities would cause temporary visual impacts due to the presence of equipment, materials, and workforce. Construction would involve the use of cranes, heavy construction equipment, temporary storage and office facilities, and temporary

laydown/staging areas. Construction of the power plant is expected to last for 18 to 20 months.

## EXISTING SETTING

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### REGIONAL SETTING

The regional setting of the project is a transitional zone between the flat, open terrain of the Central Valley and the foothills of the Sierra Nevada Mountains. The region consists of rolling topography with gentle slopes. Oak woodlands are scattered throughout the region. Major drainage channels, Pleasant Grove and Curry creeks drain the area from east to west. The oak tree groves and the riparian vegetation along the creeks create a strong visual contrast to the surrounding grasslands especially during the summer and fall when the tan color of the dry grasses dominates the landscape. Vernal pools are found throughout the region and provide additional visual interest through floral color displays in spring and early summer that contrast with the surrounding grasslands (Roseville 2003a).

### PROJECT SITE AND VICINITY

The proposed project would be situated within a 40-acre property located on Phillip Road immediately north of the newly constructed PGWWTP. The 40-acre REP property is owned by the City of Roseville and is actually comprised of three parcels that the applicant would consolidate prior to building the project (Roseville 2003a). The REP property is generally level and at about the same elevation as the surrounding parcels. The power plant and electrical switchyard would occupy approximately nine acres of this property. The REP site is currently undeveloped, open grassland that was most recently used as a construction laydown area for the PGWWTP. The project site is surrounded by agricultural uses on the north, east, and west, and by the PGWWTP on the south. The riparian corridor along Pleasant Grove Creek runs east-west approximately 1,800 feet north of the REP site.

There are three rural residences located within one half mile of the REP site: a rural residence with a large, commercial dog kennel located about 1,125 feet to the northwest; another residence about 1,250 feet directly to the north; and a third residence located north of Pleasant Grove Creek about 1,815 feet to the northeast. The R.F. Fiddymment Ranch house is located about three quarters of a mile southeast of the REP site. Fiddymment Ranch was determined to meet California and National Register criteria by the City of Roseville (please also see the **Cultural Resources** section of the PSA). The closest residential area to the project site is the Del Webb Sun City Roseville retirement community, which is located about 1.25 miles east of the site. South of Sun City on Fiddymment Road near the corner of Pleasant Grove Boulevard is the Sutter Retirement Community, which is a two-story apartment complex located about 1.5 miles southeast of the REP site.

The major roadway in the area from which views of the project would be possible is Fiddymment Road to the east. As reported in AFC Table 8.12-3, Fiddymment Road has an existing average daily traffic (ADT) volume of about 8,766 vehicles, north of Pleasant Grove Boulevard. The project site is visible from Phillip Road, which passes

immediately by the site. The current ADT on Phillip Road is 45 vehicles per day west of the REP site, and 157 vehicles per day west of Fiddymment Road.

## **VIEWING AREAS AND KEY OBSERVATION POINTS**

**Visual Resources Figure 1** (all of the visual resources figures are presented at the end of this analysis) depicts the areas from which the project would be visible (project viewshed). **Visual Resources Figure 2** shows the location and view direction of the two KOPs selected to represent two sensitive viewing areas that would be most affected by the proposed project. This figure also shows the location and view direction of the local character photographs presented on **Visual Resources Figure 3**. The KOPs are:

- KOP 1 – Northwest corner of the REP property
- KOP 2 – Fiddymment Road south of Del Webb Boulevard

### **KOP 1 – Northwest Corner of the REP Property**

KOP 1 is located at the northwest corner of the 40-acre REP property and was selected to approximate the existing view of the REP site of two rural residences located northwest and north of the site. **Visual Resources Figure 4A** shows the current view of the proposed power plant site looking southeast from KOP 1. The viewpoint is situated approximately 315 feet northeast of the single family residence and dog kennel that is located approximately 1,125 feet northwest of the center of the power plant site. (The exhaust stacks are located along the north-south centerline of the REP site within the northern half of the site.) This house faces west toward Phillip Road and looks out toward the rolling grasslands to the west and the Coast Range (visible on clear days) in the distant background. A row of tall, mature trees lines the rear of the house so views of the project site from the house are substantially screened and not unobstructed as **Visual Resources Figure 4A** suggests. A second residence is located about 1,250 feet north of the power plant site center. This house faces south and there are no intervening trees or other landscape features so the occupants have an unobstructed view of the REP site, similar to what is shown in **Visual Resources Figure 4A** except that KOP 1 is located slightly closer (approximately 125 feet) to the site center than this residence. This house is accessed via a driveway along the northern boundary of the 40-acre REP property so the site is also visible as the residents drive to and from their house.

There is a third residence located about 1,815 feet northeast of the center of the power plant site. This house is located north of Pleasant Grove Creek so the large oak trees along Pleasant Grove Creek block the view of the REP site. If any portion of the project is visible from this residence it would likely only be the tops of the stacks and the visible water vapor plumes that would emanate from the cooling tower and the two exhaust stacks. The driveway to this house runs north from Phillip Road, east of the REP site, so the residents see the REP site as they drive to and from their house. The R.F. Fiddymment Ranch is located about three quarters of a mile southeast of the site. The site is likely not visible from the main house as the property is surrounded by large trees and a large barn is located west of the house. Again, if any portion of the project is visible from the main house of Fiddymment Ranch it would likely only be the tops of the stacks and the plumes.



The most prominent features in the existing landscape visible from KOP 1 and looking toward the REP site are the open, undeveloped grassland of the city-owned parcels, several fruitless mulberry trees in the middle of the project site, several mobile homes (unoccupied), and construction trailers, temporary structures and debris associated with the construction of the PGWWTP. Several of the PGWWTP buildings are visible in the background. Although not shown in **Visual Resources Figure 4A**, trees along Pleasant Grove Creek are also visible from the KOP 1 area.

The open grasslands, although not particularly unique, are an aesthetically pleasing landscape feature in the view toward the REP site, providing seasonally contrasting colors to the riparian vegetation located to the east along Pleasant Grove Creek. However, the REP site has been degraded by the PGWWTP construction activities and the rural view from KOP 1 has already been somewhat compromised by the industrial buildings at the PGWWTP. For these reasons, the present view towards the power plant site from KOP 1 is considered to be of moderately low visual quality. While there are no unique visual elements or features in the view, residents tend to have a high level of concern regarding views in proximity to their homes. The residents represented by KOP 1 would likely value the existing, primarily rural view and would perceive additional industrial development as adversely affecting the quality of their view. Although view concern is high, because the present visual quality is moderately low, and only one residence would have an unobstructed foreground view of the project, overall visual sensitivity at KOP 1 is considered moderate.

## **KOP 2 – Fiddymment Road South of Del Webb Boulevard**

KOP 2 is located on Fiddymment Road about 1,100 feet south of its intersection with Del Webb Boulevard. **Visual Resources Figure 5A** shows the current view from this viewpoint looking to the northwest towards the PGWWTP and the REP site. This KOP was chosen to represent the view of travelers along Fiddymment Road, as well as residents in the Del Webb Sun City Roseville retirement community, which borders Fiddymment Road to the east. The retirement community consists of single-family dwellings interspersed with open riparian corridors and other open spaces, a large golf course and a community center. The community is separated from Fiddymment Road by a large concrete wall, and very few if any of the residences within the community are oriented such that their residents would have a view towards the project site.

The Sun City community is relatively new, and was constructed with attractive landscaping along its arteries and open spaces, including along the east side of Fiddymment Road, resulting in a generally pleasing, suburban character. Further south of KOP 2 and south of the Sun City community is a large two-story retirement apartment complex. Residents of a few of the apartments in this complex have a view towards the project site, about 1.5 miles away to the northwest, but most of the apartments have no views towards the project site. As the landscaping trees planted along the east side of Fiddymment Road mature, they should provide even greater screening of views toward the project site from residences located east of the road.

Travelers along Fiddymment Road and the few nearby residents with views towards the project site now see large fields in the foreground and middleground of the view, dominated by grasslands, with lines of trees and the structures of the PGWWTP in the

background. From the area of KOP 2, the most prominent features are the open grasslands, which are not irrigated and therefore are green during the rainy season, turning to tans and browns in the summer and early fall. The grasslands appear to have been shaped by decades of livestock grazing, leaving only the lines of trees in the background, and the open sky above, as the only natural elements in the viewshed from KOP 2.

Considering all the aspects that contribute to the quality of a given view, staff determined that the views toward the project site from the area of KOP 2 are of moderately low to moderate quality. Although the open grasslands and the lines of trees in the background are aesthetically pleasing, the scenic value of the view towards the project site from KOP 2 is about average when compared to the scenic value of similar views from roads in the project vicinity, as well as compared to similar settings in any area of mixed rural and suburban lands.

While residents generally tend to have a high level of concern regarding views in proximity to their homes, with the concrete walls and landscaping lining Fiddymment Road to the east, staff found little to no evidence that residences in the area of KOP 2 regularly enjoyed views towards the project site from their houses or their yards. Sun City residents do have a brief view toward the site as they exit the development at Del Webb Boulevard. Commuters in suburban areas have a much lower expectation or concern for views along their commute route than residents would have for views from the windows of their homes or from their yards.

Approximately 4,400 motorists per day have some view of the project site as they travel northbound on Fiddymment Road between Baseline Road and Phillip Road. Groves of oak trees block views of the project site for travelers further north on Fiddymment Road. From KOP 2 the most visible portion of the structures of the project, the 120-foot tall exhaust stacks, would be about 1.8 miles away at an angle of 45 degrees to the centerline of the roadway (the primary cone of vision for drivers). Further south at the intersection of Fiddymment Road and Pleasant Grove Boulevard, the project stacks would be about 2.1 miles away at an angle of about 37 degrees from the centerline of the road. The closest unobstructed view of the project from Fiddymment Road occurs near its intersection with Phillip Road, where the project stacks would be about 1.5 miles away, but at an angle of about 60 degrees from the centerline of the road, which is outside a driver's normal cone of vision. The moderate number of motorists, their high rate of speed, the over 1.5-mile distance to the project, and the nearly peripheral angle of view from the roadway all contribute to an overall moderately low degree of exposure for motorists on Fiddymment Road. Because the present visual quality is moderately low to moderate, few if any residences have views in the direction of the site, and travelers' exposure to the project site is moderately low, the overall visual sensitivity at KOP 2 is considered moderately low.

## **IMPACTS**

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The following discussion of project impacts is organized around the four questions in the Environmental Checklist (Appendix G of the CEQA Guidelines).

## **SCENIC VISTAS**

The first checklist question is: Would the project have a substantial adverse effect on a scenic vista? Staff did not identify any scenic vistas within the project viewshed, nor are any identified in either the Placer County General Plan or City of Roseville General Plan. Thus, the project would have no impact under this criterion.

## **SCENIC RESOURCES**

The second checklist question asks: Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway corridor? Existing vegetation at the REP site consists of grass and several fruitless mulberry trees in the center of the site. According to the AFC, the trees are remnants of the landscaping for a rural residence that once occupied the site. These landscape features are not considered unique or exceptionally scenic. The site does not contain rock outcroppings or historic buildings that could be damaged by the proposed project, nor is project within view of a State Scenic Highway. The REP would not block views of any identified or observed important view areas as seen from viewers in the areas of KOP 1 or KOP 2. Therefore, the project would have no impact under this criterion.

## **VISUAL CHARACTER OR QUALITY**

The third CEQA checklist question is: Would the project substantially degrade the existing visual character or quality of the site and its surroundings? The project aspects that were evaluated under this criterion include project construction, the power plant structures, the various pipelines, and visible water vapor plumes.

### **Project Construction**

The areas to the west, north, and east of the REP site and within the 40-acre REP property would be used during project construction for storage of equipment and materials and for parking by construction personnel. Construction of the proposed power plant and associated facilities would cause temporary visual impacts due to the presence of equipment, materials, and workforce. Construction would involve the use of cranes, heavy construction equipment, temporary storage and office facilities, and temporary laydown/staging areas. Construction of the power plant is expected to last for 18 to 20 months.

The visual impacts of constructing the power plant and recycled water, sanitary sewer and outfall pipelines as viewed from KOP 1 would not be significant because the visual disturbances would be temporary, these construction activities would only be highly visible to the one residence to the north with an unobstructed view of the REP site and laydown area, and the present visual quality of the view from this residence is moderately low. These activities would also be visible to the low number of travelers on Phillip Road, but because this road doesn't have any scenic designation, and the visual disturbances are temporary, the impacts on these viewers would also not be significant. Visual impacts of power plant construction would also not be significant as seen from the area of KOP 2 due to the temporary nature of these activities, the very low number of residences with unobstructed views of the REP site and laydown area, the greater

than one mile distance to the nearest of these residences, and the moderate overall visual quality of the viewshed.

Gas pipeline construction activities may be visible to some residents of Sun City and would be visible to motorists on Country Club Drive, Baseline Road, and Fiddymont Road. A typical pipeline construction team would require a bulldozer, backhoe, boom trucks, excavation diggers, material delivery trucks, welding trucks and inspection vehicles. Typically, pipeline construction activities (from site preparation to restoration) could potentially be viewed from any one residence for up to two weeks, with decreasing levels of visual clarity as the distance to construction activities increases. Because of the very temporary nature of these activities, gas pipeline construction would not cause significant visual impacts.

The AFC (page 8.7-17) states that typical construction hours would be between 7 a.m. and 7 p.m. on weekdays and 8 a.m. and 8 p.m. on weekends, and that additional hours may be necessary to complete critical construction activities. Some activities would continue 24 hours per day, seven days per week. In the event that construction occurs at night, staff believes that the applicant should take measures to minimize the offsite visibility of any construction lighting. Thus, staff proposes Condition of Certification **VIS-1** requiring light fixtures to be hooded, shielded, and directed downward and toward the area to be illuminated to prevent direct illumination of the night sky and direct light trespass (direct light extending outside the boundaries of the power plant site or the site of construction of ancillary facilities). Additionally, all lighting should be of minimum necessary brightness consistent with worker safety and security, and wherever feasible and safe and not needed for security, lighting should be kept off when not in use. These mitigation measures would ensure that construction lighting impacts, if they occur, are kept to less than significant levels.

### **Operation Impacts of the Power Plant Structures**

The power plant structures would include two 120-foot tall heat recovery steam generator (HRSG) exhaust stacks, two 53-foot tall HRSG units, two 35-foot tall gas combustion turbine generators (including the inlet air filters), a 45-foot tall steam turbine generator (including pedestal), and a 44-foot tall four-cell cooling tower. The project would include an on-site zero liquid discharge (ZLD) system to process industrial wastewater. The most prominent features of the ZLD system are the two 80-foot tall brine concentrator stacks and the two 70-foot tall crystallizer stacks.

A detailed analysis of the visual impacts of the power plant structures was conducted for each KOP and is presented below.

#### **KOP 1 – Northwest Corner of the REP Property**

KOP 1 is located at the northwest corner of the 40-acre REP property and was chosen to represent the view of three rural residences located north of the REP site. As explained earlier, only one of these residences would have an unobstructed view of the project. This residence is located about 1,250 feet north of the center of the power plant site. Open undeveloped grasslands are the predominant landscape feature occupying the current view from KOP 1. Industrial buildings at the PGWWTP are visible in the background of the view but do not dominate the view from KOP 1. The existing view is

considered to be of moderately low visual quality. **Visual Resources Figure 4B** presents a visual simulation of the proposed project as it would be seen from KOP 1.

As seen from KOP 1, the REP would introduce prominent geometric forms with industrial character into a setting without similar features. The PGWWTP buildings are visible in the background but they are fairly low on the horizon and are not prominent in the view from KOP 1. The structural characteristics of the project, including the prominent vertical elements of the two turbine/HRSG exhausts, would contrast highly with the flat, horizontal form of the existing landforms. The predominantly neutral gray colors of the project depicted in the visual simulation would contrast moderately with the blue, sky backdrop and the seasonally changing colors (green to tan and brown) of the surrounding grasslands. Overall, the REP would cause a high degree of visual contrast with the existing setting visible from KOP 1.

The power plant structures would dominate the existing structures at the PGWWTP and would occupy a large portion of the landscape visible from KOP 1. The project structures would be seen against the sky, thereby increasing the conspicuousness of the proposed REP. Overall, the REP is considered to have moderately high dominance.

Other than the sky, the project would not block any features with visual quality higher than that of the power plant itself. The severity of the view blockage caused by the project would be moderately low at KOP 1.

### ***Visual Impact Significance***

The project would cause a moderately high degree of overall visual change (as a result of its contrast, dominance, and view blockage) to the existing setting as seen from KOP 1. Taking into account that the present view is of moderately low visual quality and the moderately high degree of visual change caused by the proposed project would be experienced by the one residential viewer that would have an unobstructed extended view of the project, the visual impact of the REP structures is considered adverse but not significant.

### **KOP 2 – Fiddymment Road South of Del Webb Boulevard**

The only dominant existing structure in the view is the electric distribution line adjacent to west side of Fiddymment Road. The foreground and middleground of the view is dominated by open grasslands. In the background are lines of trees near the horizon, and the PGWWTP structures. Very few other structures are visible in the background of the views from KOP 2. The present view from KOP 2 toward the REP site is of moderately low to moderate visual quality. **Visual Resources Figure 5B** presents a visual simulation of the proposed project as viewed from KOP 2.

As seen from KOP 2, the simple geometric forms and straight lines of the project structures would be similar to the forms and lines of the PGWWTP to the south of the REP site. The HRSG exhaust, brine concentrator, and crystallizer stacks would be similar to other vertical elements in the view from KOP 2. The medium-gray color depicted on the majority of the structures would blend with the sky and contrast moderately with the seasonally changing colors of the field (green to brown) and the

seasonally green trees in the foreground. Overall, visual contrast with the existing setting would be moderately low.

The power plant structures would appear comparable in size to the structures of the PGWWTP. The project would occupy a very small portion of the landscape visible from KOP 2. Although the HRSG units and the stacks would be seen against the sky, increasing the visibility of the proposed project somewhat, overall the REP would be a subordinate feature in the view from KOP.

The project structures would block from view a very small portion of the sky. The project would also block from view some trees in the background, but these trees are a relatively small feature in the view from KOP 2. The severity of the view blockage is considered low.

### ***Visual Impact Significance***

The project would cause a low degree of overall visual change to the existing setting as seen from the area of KOP 2. When considered within the context of the moderately low visual sensitivity of the existing landscape, the low degree of visual change that would be perceived from KOP 2 would not substantially degrade the existing visual quality of the area, and therefore would result in an adverse but less than significant impact.

### **Operations Impacts of Linear Facilities**

After the various REP pipelines are buried, RE would return the areas disturbed by construction activities to their pre-construction condition, thereby minimizing the impact on the landscape. Warning signs would mark the location of the underground natural gas supply pipeline. These signs would likely go unnoticed by passersby and therefore would not result in adverse visual impacts. Thus, operation of the pipelines would cause no visual impacts. Because the open ditch portion of the outfall would be below grade it would not be highly visible and therefore would cause no adverse visual impacts.

### **Impacts of Cooling Tower and Combustion Exhaust Plumes**

The REP project is proposed to be a combined-cycle power plant that would include a four-cell, 44-foot-tall cooling tower, and two 120-foot tall turbine/HRSG exhaust stacks. The proposed gas turbines will either be Alstom GTX 100 or General Electric LM 6000 PC Sprint type engines. The visible water-vapor (steam) plumes from both the cooling towers and exhaust stacks could have an adverse effect on visual resources in the vicinity of the project. Water vapor plumes are generally associated with heavy industrial land uses and thus tend to be regarded negatively by visually sensitive observers. The severity of the impact created by visible plumes depends on several factors, including the frequency of occurrence and physical sizes of the plumes, the sensitivity of the viewers who will see the plumes, the distance between the plumes and the viewers, the visual quality of the existing viewshed, and whether any scenic landscape features would be blocked by the plumes.

RE has not proposed any methods to abate the visible plumes that would be emitted by either the cooling tower or the turbine/HRSG exhausts. Staff completed a visible plume

modeling analysis of the unabated cooling tower and turbine/HRSG exhausts (Walters and Blewitt, 2004). The project also includes a small auxiliary boiler, which has the potential for occasional visible plumes. However, the auxiliary boiler is not expected to operate often enough to be a source of significant plume frequency, therefore staff did not model the auxiliary boiler. The following discussion summarizes the results of staff's plume modeling analysis.

The first step in staff's plume analysis methodology is to determine how frequent the water vapor plumes are predicted to occur. Staff focuses its analysis on the portion of the year when the ambient conditions (i.e., temperature and relative humidity) are such that plumes are most likely to occur (typically November through April) and when "clear" sky conditions are present because this is when the plumes would cause the most visual contrast and have the greatest potential to cause adverse visual impacts. Staff typically eliminates from consideration plumes that occur at night or during rain or fog conditions because plume visibility, and overall visual quality, is typically low during those conditions. In addition, plumes that occur during specific cloudy conditions are also eliminated because under these conditions, plumes have less contrast with the background sky. For this project the meteorological data set used in the analysis categorizes total sky cover and opaque sky cover in 10 percent increments. Staff has included in the "Clear" category a) all hours with total sky cover equal to or less than 10 percent plus b) half of the hours with total sky cover 20-100 percent that have sky opacity equal to or less than 50 percent. The rationale for including these two components in this category is as follows: a) plumes typically contrast most with the sky under clear conditions and, when total sky cover is equal to or less than 10 percent, clouds either do not exist or they make up such a small proportion of the sky that conditions appear to be virtually clear; and b) for a substantial portion of the time when total sky cover is 20-100 percent and the opacity of sky cover is relatively low (equal to or less than 50 percent), clouds do not substantially reduce plumes' contrast with the sky; staff has estimated that approximately half of the hours meeting the latter sky cover and sky opacity criteria can be considered high visual contrast hours and are included in the "clear" sky definition.

Staff calculated the frequency of the cooling tower and HRSG plumes using the Combustion Stack Visible Plume (CSVP) model and a four-year (1990-1993) meteorological data set, obtained from the National Climatic Data Center, from Sacramento International Airport.

**Visual Resources Table 1** provides the REP cooling tower plume frequency results. For the proposed cooling tower, the maximum temperatures where a plume is expected to occur are 81°F (77% RH) and 75°F (90% RH) when operating with and without duct firing, respectively, based on the Alstom GTX100 turbine/HRSG design. For the LM6000 PC Sprint turbine/HRSG design, the maximum temperatures where a cooling tower plume is expected to occur are 75°F (90% RH) and 70°F (93% RH) with and without duct firing, respectively.

The cooling tower plume frequencies (seasonal daylight clear) during base load conditions are 23.1 percent with the GTX turbines and 24.6 percent with the Sprint turbines. During peaking operations, the seasonal daylight clear plume frequencies are 62.9 percent with the GTX turbines and 53.6 percent with the Sprint turbines. Peaking

operations, based on Table 8.1-10 of the AFC are anticipated to occur frequently, over 46 percent of the year and almost one-half of the time the plant is in operation. Peaking operations are assumed to occur during daylight hours rather than nighttime hours as daylight hours correspond to peak electrical demand. Therefore, based on the applicant's operating schedule, peaking operations can be assumed to occur during all seasonal daylight hours.

**Visual Resources Table 1**  
**Staff Predicted Hours with Cooling Tower Steam Plumes**  
**Sacramento 1990-1993 Meteorological Data**

Case	Available (hr)	Alstom GTX100 Base Load		LM6000 PC Sprint Base Load	
		Plume (hr)	Percent	Plume (hr)	Percent
All Hours	34,980	16,302	46.6%	15,201	43.5%
Daylight Hours	17,865	4,411	24.7%	4,167	23.3%
Daylight No Rain No Fog	16,028	2,643	16.5%	2,428	15.1%
Seasonal Daylight Hours*	8,004	3,497	43.7%	3,494	43.7%
Seasonal Daylight No Rain No Fog*	6,339	1,865	29.4%	1,881	29.7%
Seasonal Daylight Clear*	3,378	783	23.1%	832	24.6%
Case	Available (hr)	Alstom GTX100 Peaking		LM 6000 PC Sprint Peaking	
		Plume (hr)	Percent	Plume (hr)	Percent
All Hours	34,980	25,062	71.6%	23,498	67.2%
Daylight Hours	17,865	9,150	51.2%	8,133	45.5%
Daylight No Rain No Fog	16,028	7,327	45.7%	6,313	39.4%
Seasonal Daylight Hours**	7,781	6,052	77.8%	5,554	71.4%
Seasonal Daylight No Rain No Fog**	6,123	4,396	71.8%	3,899	63.7%
Seasonal Daylight Clear**	3,475	2,186	62.9%	1,863	53.6%

\*The seasonal period is November through April for base case conditions.

\*\*For the duct firing (peaking) case, the seasonal period is October through March to better match the applicant's data (plant dispatch schedule – AFC Table 8.1-10) for worst-case plume.

**Visual Resources Table 2** provides the turbine/HRSG plume frequency results. For the proposed HRSGs operating with GTX turbines, the maximum temperature where a visible plume is predicted is 50°F when the relative humidity is 100 percent, when operating at base load conditions; and 64°F when the relative humidity is 93 percent, when operating at peaking load conditions. For the proposed HRSGs operating with Sprint turbines, the maximum temperature where a visible plume is predicted is 57°F when the relative humidity is 100 percent, when operating at base load conditions; and 75°F when the relative humidity is 90 percent, when operating at peaking load conditions.

When operating in base load, the HRSG plume frequencies during seasonal daylight clear hours are very low. Due to these very low frequencies staff would not consider the visual impacts caused by the base load HRSG plumes to be significant. However, both turbines show considerably higher plume frequencies during peaking load conditions, particularly the Sprint turbines which would produce plumes 59.1 percent of the seasonal daylight clear hours. As explained earlier, based on the applicant's operating schedule, peaking operations can be assumed to occur during all seasonal daylight hours. Because of the very high frequencies of the peaking HRSG plumes, staff calculated the plume dimensions during seasonal daylight clear conditions.



**Visual Resources Table 2**  
**Staff Predicted Hours with HRSG Steam Plumes**  
**Sacramento 1990-1993 Meteorological Data**

Case	Available (hr)	Alstom GTX100 Base Load		LM6000 PC Sprint Base Load	
		Plume (hr)	Percent	Plume (hr)	Percent
All Hours	34,980	4,130	11.8%	6,878	19.7%
Daylight Hours	17,865	914	5.1%	1,566	8.8%
Daylight No Rain No Fog	16,027	186	1.2%	450	2.8%
Seasonal Daylight Hours*	8,004	906	11.3%	1,532	19.1%
Seasonal Daylight No Rain No Fog*	6,339	182	2.9%	431	6.8%
Seasonal Daylight Clear*	3,378	119	3.5%	236	7.0%
Case	Available (hr)	Alstom GTX100 Peaking		LM 6000 PC Sprint Peaking	
		Plume (hr)	Percent	Plume (hr)	Percent
All Hours	34,980	16,058	45.9%	23,668	67.7%
Daylight Hours	17,865	4,514	25.3%	8,322	46.6%
Daylight No Rain No Fog	16,028	2,765	17.3%	6,502	40.6%
Seasonal Daylight Hours**	7,781	3,671	47.2%	5,806	74.6%
Seasonal Daylight No Rain No Fog**	6,123	2,049	33.5%	4,151	67.8%
Seasonal Daylight Clear**	3,475	963	27.7%	2,054	59.1%

\*The seasonal period is November through April for base case conditions.

\*\*For the duct firing (peaking) case, the seasonal period is October through March.

The next step in the visible plume analysis is to determine plume dimensions during seasonal daylight clear conditions. The cooling tower visible plume dimensions for base load and peaking operations, as estimated by the CSVP model, are presented in **Visual Resources Table 3** below. The turbine/HRSG plume dimensions for peaking operations, as estimated by the CSVP model, are presented in **Visual Resources Table 4**.

As shown in **Visual Resources Table 3**, the cooling tower plumes (with the GTX turbines) that are predicted to occur one percent of the time are estimated to be 1,722 feet long and 2,217 feet high during base load conditions, and 2,985 feet long and 3,674 feet high during peaking operations. As reported in **Visual Resources Table 4**, the one percentile HRSG plumes are estimated to be 1,210 feet long and 1,260 feet high, and 1,686 feet long and 1,538 feet high for the GTX and Sprint turbines, respectively. Although the one percentile plumes would be very large and very noticeable to a wide area, they would occur very infrequently – only about nine hours per seasonal period. For this case, staff considers the 20<sup>th</sup> percentile plume to be the reasonable worst case plume on which to base its visual impact analysis. As can be seen in **Visual Resources Tables 2 and 4**, the 20<sup>th</sup> percentile plume is the smallest of the plumes that are predicted to occur zero to 20 percent of the time, and it is the largest of the plumes that are predicted to occur greater than 20 percent of the time. Plumes as large as or larger than the 20<sup>th</sup> percentile plume are predicted to occur approximately 174 hours per seasonal period. The 20<sup>th</sup> percentile base case cooling tower plumes would be 36 feet long and 82 feet high (from ground level) with the GTX turbines, and 39 feet long and 85 feet high with the Sprint turbines. During peaking operations, the 20<sup>th</sup> percentile cooling tower plumes would be 295 feet long and 335 feet high with the GTX turbines, and 243 feet long and 262 feet high with the Sprint turbines. The 20<sup>th</sup> percentile HRSG plumes are predicted to be 154 feet long and 180 feet high (from ground level) with the GTX

turbines, and 239 feet long and 253 feet high with the Sprint turbines. For each KOP, staff conducted a visual impact analysis of the reasonable worst case REP plumes, which is presented below.

**Visual Resources Table 3**  
**Staff Predicted “Clear” Hours Cooling Tower Plume Dimensions**

Turbine	Cooling Tower “Clear” Hours Plume Dimensions		
Alstom GTX100 Base Load			
Percentile	Length	Height	Width
1%	525 (1,722)	676 (2,217)	110 (361)
5%	143 (469)	143 (469)	46 (151)
10%	49 (161)	62 (203)	34 (112)
20%	11 (36)	25 (82)	22 (72)
Alstom GTX100 Peaking			
Percentile	Length	Height	Width
1%	910 (2,985)	1,120 (3,674)	175 (574)
5%	315 (1,033)	372 (1,220)	78 (256)
10%	139 (456)	190 (623)	49 (161)
20%	90 (295)	102 (335)	40 (131)
30%	61 (200)	68 (223)	36 (118)
40%	38 (125)	47 (154)	32 (105)
50%	19 (62)	31 (102)	26 (85)
60%	5 (16)	20 (66)	19 (62)
LM6000 PC Sprint Base Load			
Percentile	Length	Height	Width
1%	514 (1,686)	610 (2,001)	107 (351)
5%	149 (489)	136 (446)	45 (148)
10%	52 (171)	60 (197)	32 (105)
20%	12 (39)	26 (85)	22 (72)
LM6000 PC Sprint Peaking			
Percentile	Length	Height	Width
1%	824 (2,703)	993 (3,257)	157 (515)
5%	268 (879)	317 (1,040)	69 (226)
10%	119 (390)	157 (515)	46 (151)
20%	74 (243)	80 (262)	38 (125)
30%	43 (141)	52 (171)	32 (105)
40%	21 (69)	34 (112)	27 (89)
50%	6 (20)	20 (66)	19 (62)

Data provided in meters and (feet) and height includes the 44 foot tower height.

**Visual Resources Table 4**  
**Staff Predicted “Clear” Hours Turbine/HRSG Plume Dimensions**

Turbine	Turbine/HRSG “Clear” Hours Plume Dimensions		
Alstom GTX100 Peaking			
Percentile	Length	Height	Width
1%	369 (1,210)	384 (1,260)	71 (233)
5%	134 (440)	141 (462)	30 (98)
10%	67 (220)	82 (269)	19 (62)
20%	47 (154)	55 (180)	14 (46)
LM6000 PC Sprint Peaking			
Percentile	Length	Height	Width
1%	514 (1,686)	469 (1,538)	95 (312)
5%	153 (502)	184 (604)	39 (128)
10%	77 (253)	118 (387)	24 (79)
20%	73 (239)	77 (253)	19 (62)
30%	58 (190)	63 (207)	16 (52)
40%	45 (148)	54 (177)	14 (46)
50%	34 (112)	47 (154)	12 (39)

Data provided in meters and (feet) and height includes the 120 foot stack height.

## **KOP 1 – Northwest Corner of the REP Property**

Staff did not identify any other existing sources of industrial plumes in the project viewshed. There could be the potential for fog forming above the waste water ponds at the PGWWTP as cold, dry air moves across the warmer water. This phenomenon would appear more like fog than the distinct plumes that would be created by the REP cooling tower and HRSG exhausts, so the project's plumes would be a unique and new feature in the project area. In addition, the fog forming above the PGWWTP waste water ponds likely would not rise very high above the water.

Due to the openness of the project site and surrounding area, the high frequency and large sizes of the REP water vapor plumes during peaking operations would cause a noticeable but intermittent change in the landscape character when viewed from nearby vantage points. The plumes would be most prominent as viewed from within the foreground distance zone (up to one-half mile). The area within approximately one-half mile of the site is sparsely populated. The only existing residences within this area are the three rural residences located north of the REP site whose view is represented by KOP 1. The plumes would also be visible to the residents at R.F. Fiddymont Ranch, which is located about three quarters of a mile southeast of the site.

The plumes would appear as prominent, billowing linear-to-irregular forms with irregular and changing outlines. The cooling tower plumes would originate closer to ground level than the HRSG plumes which would originate above the 120-foot tall stacks. Both plumes would rise vertically on calm days, and diagonally across the sky when the wind is blowing. The movement of the plumes would be noticeable from foreground viewing locations, and less noticeable from middleground to background viewing locations.

Under clear sky viewing conditions, the white cooling tower plumes would contrast highly with the blue sky background. The vertical and diagonal, irregular and changing form of the plume would distinguish the plume from the broad, horizontal, natural landforms and the generally uniform appearance of sky. As seen from KOP 1, overall visual contrast of the plumes with the existing setting is high.

With the GTX turbines, the reasonable worst case cooling tower plumes would be approximately 36 feet long and 82 feet high (including the 44-foot tall cooling tower) during base load conditions, and 295 feet long and 335 feet high during peaking load operations. With the Sprint turbines, the cooling tower plumes would be about 39 feet long and 85 feet high during base load conditions and 243 feet long and 262 feet high during peaking operations. The base load cooling tower plumes would only rise about 40 feet above the cooling tower and would be shorter than the tallest elements of the project, which are the two 120-foot tall HRSG exhaust stacks. Plumes of these sizes would not cause significant visual impacts. The peaking cooling tower plumes would be between approximately 142 feet and 215 feet taller than the two 120-foot tall HRSG stacks. Plumes of these heights would be about as tall as a 20- to 25-story office building. The reasonable worst case HRSG plumes (peaking) would be 154 feet long and 180 feet tall (including the 120-foot exhaust stack), and 239 feet long and 253 feet tall for the GTX and Sprint turbines, respectively. The HRSG plumes with the Sprint turbines would be over twice as tall as the exhaust stacks. Intermittently, the cooling tower and HRSG plumes during peaking operations would become the major feature in

the immediate project area. The movement of the plumes, their elevated position above the viewers in the area of KOP 1, and their backdrop against the sky would all contribute to the prominence of the plumes. The REP plumes would be a dominant feature for viewers represented by KOP 1 while the plant is in peaking operations.

When the plumes are present, they would block portions of the sky. No other unique or notable scenic features would be blocked by the plumes. The severity of the view blockage caused by the plumes is considered moderately low at KOP 1.

### ***Visual Impact Significance***

The plumes during peaking load operations would cause a moderately high degree of overall visual change (as a result of their contrast, dominance, and view blockage) to the existing setting as seen from KOP 1. Taking into account that the present view is of moderately low visual quality and the moderately high degree of visual change caused by the reasonable worst case plumes would be experienced by very few residential viewers (the three residences immediately north of the site), the visual impact of the visible plumes is considered adverse but not significant.

### **KOP 2 – Fiddymment Road South of Del Webb Boulevard**

For any resident or traveler near KOP 2, the reasonable worst case plumes (during both base and peaking load conditions) would be a relatively small feature in the broad, panoramic landscape off to the northwest about 1.5 miles away. For most of the year, the prevailing winds (from the southeast or south) in the project area would tend to blow the plumes away from viewers near KOP 2. Furthermore, the plumes would generally be most visible in early morning hours when travelers on Fiddymment Road are most likely to be headed south, away from the project site.

In the instances when visible plumes would appear above the REP, the plumes would not block any view of important visual resources in the area. The plumes would not greatly contrast with the surroundings because of their relatively small size compared to other distinct landscape features and to the broad landscape, and their white color would blend somewhat with the haze close to the horizon.

### ***Visual Impact Significance***

The overall visual change to the viewshed caused by REP cooling tower and exhaust stack plumes would be moderately low because of the plumes moderately low degree of contrast and dominance and low degree of view blockage. When considered within the context of the moderate overall sensitivity at KOP 2, the moderately low degree of visual change caused by the plumes would not substantially degrade the existing visual quality of the view, and therefore would result in an adverse but less than significant visual impact.

### **Future Viewers in the West Roseville Area**

Although staff has found the visual impacts of the project to be less than significant on existing viewers, staff is concerned about the impacts of the project structures and water vapor plumes on future viewers in the West Roseville area.

Under the WRSP, the segment of Phillip Road south of the site would become a private drive serving the REP and PGWWTP, and Phillip Road east of the site would be realigned to continue north instead of west. This section of Phillip Road would connect with Blue Oaks Boulevard to the north of the REP site, which would be extended west from Fiddymont Road. According to the Environmental Impact Report (EIR) for the WRSP, Blue Oaks Boulevard west of the realigned Phillip Road is projected to have a daily traffic volume of 10,600 vehicles at build-out (2020). The three City-owned parcels that the REP site is part of are adjacent to these future roads. The AFC states that as an adjacent developer to the WRSP, RE would be responsible for landscaping within the landscape easements on the south side of Blue Oaks Boulevard, and the west side of Phillip Road (pages 8.13-10 – 8.13-11). When staff asked in a data request when the applicant intended on planting this landscaping, RE responded that the City of Roseville, not RE, would be planting the landscaping and that it would be installed on City property, not the power plant site, as part of the build-out of the WRSP (CH2MHill 2004a, Data Response 64). In addition, Data Response 63 stated that the landscaping would not be a part of the REP project, per se, and that the City as a landowner adjacent to the WRSP would be responsible for providing the landscaping. Staff does not see a distinction between the City of Roseville and RE as RE is the city's electric department. Furthermore, the project would be built on city-owned parcels (which would be consolidated into one 40-acre parcel) that would abut the two future roads. Staff believes that landscaping should be installed along the four boundaries of the 40-acre REP parcel (and outside the location of the travel lanes of the future roads) prior to the start of operation of the power plant so that by the time the WRSP is built out the trees would have grown to provide substantial screening of the power plant as seen from nearby roads, residential areas, and parklands in the WRSP area. Planting the landscaping prior to power plant operation would also have the benefit of reducing, over time, the adverse visual impacts on the existing rural residences north of the site and travelers on Phillip Road. Staff notes that the landscaping and berms have already been installed around the PGWWTP property, including along Phillip Road. Staff has therefore proposed Condition of Certification **VIS-2** to require RE to install landscaping along the four boundaries of the 40-acre REP property no later than the start of project operation.

Staff understands that the architects of the WRSP were aware of the REP when the specific plan was being drafted. However, staff is uncertain whether the planners were aware of the potentially high frequency and large sizes of the visible water vapor plumes when the REP is operating in peaking mode. Because water vapor plumes are generally associated with heavy industrial land uses, they tend to be regarded negatively by visually sensitive observers (e.g., residential and recreational viewers). The EIR for the WRSP identifies the REP as a possible future land use adjacent to the WRSP area, but the EIR does not discuss incompatibility issues between the power plant and the WRSP land uses. The EIR does discuss potential incompatibility issues between the proposed WRSP land uses and the existing PGWWTP.

The REP AFC did not present any plume modeling results, only the statement that "It is likely that visible plumes will not be seen emanating from [the] REP cooling towers under most circumstances." The applicant's data adequacy filing provided the following supplemental information about plumes: "Out of the five years of McClellan Air Force Base meteorological data used in the air quality modeling analysis (43,800 hours), only

324 (0.74 percent) were associated with the air temperatures conducive to plume formation (less than 34°F) if humidity is also high” (Roseville 2003b). In contrast, staff’s modeling determined that plumes would occur at temperatures much higher than 34 degrees Fahrenheit and at much higher frequencies. For example, of the 34,980 hours in the four years of Sacramento International Airport meteorological data used in staff’s plume modeling analysis, staff found that cooling tower plumes (with the GTX turbines) would form for 16,302 hours (46.6 percent) if in base load operation or 25,062 hours (71.6 percent) if peaking. This equates to between approximately 4,076 and 6,266 hours per year of plumes.

During peaking operations, the reasonable worst case cooling tower plume dimensions are estimated to be 295 feet long and 335 feet tall (from the ground) with the GTX turbines, and 243 feet long and 262 feet tall with the Sprint turbines. The reasonable worst case HRSG exhaust plumes are estimated to be 154 feet long and 180 feet tall with the GTX turbines, and 239 feet long and 253 feet tall with the Sprint turbines. Plumes of these sizes would be quite noticeable from the proposed residential areas to the northeast and southwest, and the regional parks and open space to the west and northeast, within one-half mile of the REP site, and may be perceived as unappealing by these visually sensitive viewers. These plumes would also be highly visible to future travelers on Blue Oaks Boulevard (westward extension), Phillip Road (rerouted), and West Side Drive when these roads are constructed as part of the build-out of the WRSP. Plumes of these sizes and larger are predicted to occur approximately 174 hours per seasonal period (October through March).

Technology is available to abate cooling tower and HRSG plumes. Several projects approved by the Energy Commission have included plume-abated cooling towers or HRSGs where the visual impact of plumes was a concern, such as Calpine’s Russell City and Metcalf Energy Centers, which have both plume-abated cooling towers and HRSGs, and Sempra’s Palomar Energy Project and Calpine’s Los Esteros Critical Energy Facility, which have plume-abated cooling towers only. In the case of Palomar, the unabated HRSG plume frequencies were predicted to be low, and in the case of the simple-cycle Los Esteros project, the extremely high exhaust stack temperatures preclude the formation of visible plumes. At the PSA Workshop, Energy Commission staff would like to discuss with the City of Roseville planning staff whether they have concerns about the REP’s visible plumes having a negative aesthetic impact on the WRSP. If the City planners are concerned, staff would like to discuss with Roseville Electric whether they would consider revising the project to include a plume-abated cooling tower (i.e., wet/dry hybrid) and plume-abated HRSGs (i.e., economizer bypass system to raise the stack temperature) to minimize the size and frequency of the plumes to achieve better compatibility with future land uses. Staff is prepared to discuss at the workshop staff’s estimates of the capital and operating costs of plume abatement, including the costs of installing the abatement at the outset of the project versus retrofitting the project at a later date.

## **LIGHT OR GLARE**

The fourth CEQA checklist question asks: Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area? Currently there are no sources of nighttime lighting at the REP site. There are sources

of nighttime lighting in the vicinity of the site that are visible from KOPs 1 and 2, including streetlights along Fiddymment Road and security and operations lighting at the PGWWTP. The REP project would require nighttime lighting for operational safety and security. If project lighting were uncontrolled, the resultant direct light trespass and uplighting to the nighttime sky could cause significant adverse visual impacts on nearby sensitive visual receptors, such as the residences in the KOP 1 area, and in the case of uplighting, adverse impacts on more distant visual receptors too, such as those near KOP 2.

RE has committed to minimizing offsite lighting impacts (Roseville 2003a; pages 8.13-11, 8.13-13, and 8.13-16). Specifically, exterior lights would be hooded to prevent direct illumination of the night sky. In addition, lights would be directed downward and situated and designed (shielded) to prevent dispersal of direct light onto adjacent properties. High illumination areas not occupied on a regular basis and not required to be lighted to provide security would be provided with switches or motion detectors to light these areas only when occupied. Illumination levels would be limited to that required for worker safety and security. Because of RE's commitment to minimize offsite light impacts, the REP project would not create a substantial new source of light or glare that could adversely affect nighttime views. Staff proposes Condition of Certification **VIS-3**, which would require review and approval of a lighting plan for the project by Energy Commission staff to ensure that the measures proposed by RE are properly implemented.

The applicant proposes to paint all major project structures in neutral colors to blend with each other and the surrounding environment. The predominately gray project colors would blend well with the sky, helping the plant fade into the background when seen from a distance. The AFC specified that the various project buildings would have "off white" colored walls. In Data Request 65, staff expressed concern that the off-white color of these buildings could cause offsite glare impacts. RE responded that a less contrasting color (such as a medium gray color like that proposed for the bulk of the power plant structures) could be selected during compliance from the manufacturer's standard colors (CH2MHill 2004a). Additionally, staff requested that the applicant consider incorporating measures that could minimize the amount of sunlight that could potentially be reflected off of the aluminum lagging that typically covers brine concentrator and crystallizer stacks, HRSG piping and drums, and in some cases HRSG stacks. To address this potential daytime glare issue, RE proposes to use the corrugated or embossed-type aluminum lagging where it would be visible offsite. Furthermore, where feasible, the applicant would treat structures visible offsite with non-reflective paints and use embossed or corrugated surfaces (CH2MHill 2004a, Data Response 66). Staff proposes Condition of Certification **VIS-4**, which would require review and approval of a surface treatment plan for the project structures by Energy Commission staff to ensure that the measures proposed by RE are properly implemented. With the mitigation measures proposed by RE and staff, the REP would not be a source of substantial glare that could adversely affect daytime views in the project area.

## CUMULATIVE IMPACTS

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As defined in Section 15355 of the CEQA Guidelines (Cal. Code Regs., tit. 14), a cumulative impact is created as a result of the combination of the project under consideration together with other existing or reasonably foreseeable projects causing related impacts. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time. In other words, though any one project in a given area may not create a significant impact to visual resources, the combination of the new project with all existing or planned projects in the area may create significant impacts. The significance of the cumulative impact would depend on the degree to which (1) the viewshed is altered; (2) visual access to scenic resources is impaired; or (3) visual quality is diminished.

The PGWWTP is the only existing project in the immediate vicinity of the REP site. The REP in combination with the PGWWTP would increase the industrial character of the primarily rural, agricultural area. Looking from KOP 1, the PGWWTP is not dominant in the view as the buildings have a low profile and are partially screened from view by the berm that was constructed along the northern boundary of the PGWWTP along Phillip Road. Landscaping has been planted around the PGWWTP which over time will reduce the visibility of the waste water treatment plant buildings. The REP would appear much more massive in the view from KOP 1 because it includes structures that are larger than the PGWWTP buildings and it would be located closer to this viewpoint. However, the cumulative visual impact of the REP and the PGWWTP is not considered significant from KOP 1 because the viewpoint represents so few sensitive viewers, the present visual quality is moderately low, and the REP would block much of the PGWWTP buildings from view but would not block any important scenic resources.

The existing view from KOP 2 is largely dominated by pasture land in the foreground and middleground of the view. The PGWWTP is located about 1.25 miles northwest of KOP 2 so it is not very noticeable from this viewpoint. The only dominant structure in the view is the electric distribution line that runs along the west side of Fiddymont Road. Because few if any residences in the area are oriented such that they would have views of the REP project, because the REP site is currently open space with no dominant structures near it, and because the current view is of moderately low to moderate visual quality, the cumulative visual impact of the REP in combination with existing projects is not considered significant from KOP 2.

In February the City of Roseville approved the West Roseville Specific Plan. The WRSP envisions approximately 8,400 new residential units in the areas west, south, east, and northeast of the proposed REP site, as well as some general and light industrial development immediately west and south of the PGWWTP. The WRSP would substantially change the visual character of the area surrounding the REP site. As seen from KOP 1, the REP project would substantially contribute to this change in character due to its proximity to the viewpoint and large mass, but because the viewpoint represents so few existing sensitive viewers, the REP would not combine together with the WRSP to cause significant cumulative visual impacts. The development proposed in the WRSP would block views of the REP project from the KOP 2 area, so the REP would not combine together with the WRSP to cause significant cumulative impacts on existing viewers at this viewpoint.



## COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

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### LOCAL

A power generation facility is a conditionally permitted use in the Public/Quasi-Public zoning district, which is the zoning designation on the REP site. According to the AFC, because this is a City of Roseville project, the City would not issue itself a conditional use permit (CUP). Rather, the City of Roseville has an established process for the review and approval of City projects that mirrors the CUP process for private development projects. In this process, the City's Community Development Department coordinates the review of City projects by all applicable City departments to develop a comprehensive list of conditions of approval. RE stated that the City of Roseville would providing in March 2004 a set of proposed conditions of approval for the project for consideration by Energy Commission staff (CH2MHill 2004a; Data Response 42). The City's proposed conditions have not been received. **Visual Resources Table 5** provides a listing of the applicable visual resources-related LORS for the City of Roseville and presents Energy Commission staff's determination of the project's consistency with these LORS. In some instances as noted below, staff is uncertain whether the project is consistent with the City's policies, and therefore staff needs the City's assistance to make a final determination of LORS conformance. Staff is hopeful that the anticipated City review of the project will also address the REP's consistency with the City's visual resources-related policies so that the City's input can be incorporated into the Final Staff Assessment (FSA).

**Visual Resources Table 5  
Proposed Project's Consistency with  
Local LORS Applicable to Visual Resources**

<b>City of Roseville General Plan Land Use Element, Community Design Component, Chapter C. Goals and Policies</b>	
<b>Provision</b>	Goal 1: "Achieve a consistent level of high quality aesthetic and functional design through the development of, and adherence to, superior design concepts and principles as defined in the Community-wide Design Guidelines." Policy 1: "Through the design review process, apply design standards that promote the use of high quality building materials, architectural and site designs, landscaping, signage, and amenities." Policy 3: "Encourage designs that strike a balance between the incorporation of aesthetic and development requirements, and the economic considerations associated with development."
<b>Consistency</b>	<b>Possibly Consistent.</b> Though the Roseville General Plan places emphasis on innovative and attractive design as a key element to the appearance of the city, it also allows flexibility in the design and building materials based on "economic considerations associated with the development." Many of the power plant structures are essentially equipment. Very few actual buildings would be constructed. Consistency with the design guidelines is discussed below. Further consistency documentation would likely come in the form of the "conditions of approval" the City intends on forwarding to the Energy Commission for consideration in the REP license.

**Visual Resources Table 5  
Proposed Project's Consistency with  
Local LORS Applicable to Visual Resources**

<b>City of Roseville General Plan Land Use Element, Community Design Component, Chapter D, Implementation Measures, Community Design Guidelines</b>	
<b>Provision</b>	This section authorizes the city to implement Community Design Guidelines, including establishing minimum standards for design components related to aesthetics (Polices G 106, RTPAQ 106, RND 1). The Community Design component includes goals and policies that address aesthetics and function; the integration of the built and natural environment; and community character. Emphasis is placed on the development of a design framework that reflects the City's goal of high quality, community-wide design. The guidelines produced by the City Planning Department under authority of the Land Use Element of the General Plan identify minimum standards for items such as pedestrian access, signage, aesthetics, and techniques to achieve compatibility between uses and opportunities for alternate modes of transportation. Addressing landscaping, Chapter D states that the selection of plants should balance "visual, cultural and functional characteristics, as well as maintenance, balance, scale, form, texture, unity, drainage, erosion, wind and noise barriers, and energy considerations."
<b>Consistency</b>	<b>Possibly Consistent.</b> Consistency with the Community Design Guidelines goals and policies as described in this section of the Land Use Element is discussed below. Further consistency documentation would likely come in the form of the "conditions of approval" the City intends on forwarding to the Energy Commission for consideration in the REP license.
<b>City of Roseville Community Development Guidelines; Chapter 5, Design Guidelines for Industrial Districts</b>	
<b>Provision</b>	<b>Industrial Design Goal:</b> "It is the goal of the Design Guidelines for Industrial Projects to lead to developments which will maximize the efficiency and utility of the project, present an appealing appearance to public view, and minimize any adverse impacts to adjacent properties."
<b>Consistency</b>	<b>Possibly Consistent.</b> Although not likely to be considered to have an "appealing appearance," the project structures would be painted or treated to visually blend with the surrounding environment, structures would be repainted as needed to maintain a high-quality appearance for the life of the project, and surfaces would be treated to not create substantial glare (see staff's proposed Condition of Certification <b>VIS-4</b> ). Lighting would be controlled to minimize adverse impacts on adjacent properties (condition <b>VIS-3</b> ). Visible plumes from the project, particularly those emanating from the cooling towers may be perceived as unappealing, considering the high aesthetic standards of the WRSP. Plume abatement for the cooling tower would cause a small decrease in efficiency of the power plant. Plume abatement for the HRSGs would have a larger negative effect on efficiency. Staff intends to discuss this issue with RE and the City at the upcoming PSA Workshop.
<b>Provision</b>	<b>A. Site Design; 5.A.1. General Design Intent:</b> "To promote designs that consider, and respond appropriately, to adjacent uses."
<b>Consistency</b>	<b>Possibly Consistent.</b> See Industrial Design Goal discussion above.
<b>Provision</b>	<b>A. Site Design 5.A.2 Site Planning and Building Siting; a. Site Coverage.</b> Intent: "To ensure that industrial projects are designed to include a mix of building footprint, landscape/open space areas, and parking and circulation areas, in balanced proportions that create beneficial bulk, mass and scale relationships within and between adjacent projects." "...Landscaped or other open space areas shall constitute a portion of the parcel as required by the Zoning Ordinance and dictated by site features."
<b>Consistency</b>	<b>Yes, As Conditioned.</b> See discussion below for 5.A.3 Streetscape Design.
<b>Provision</b>	<b>b. Setbacks</b>

**Visual Resources Table 5**  
**Proposed Project's Consistency with**  
**Local LORS Applicable to Visual Resources**

	Intent: "To provide space and distance for light and air, to enhance privacy and security, and to create space where landscaping can be established to buffer adjacent projects and screen undesirable views when needed or desired."
<b>Consistency</b>	<b>Yes.</b> The project appears to be set back from the property lines a sufficient distance to allow landscaping to be installed around all four boundaries of the 40-acre REP parcel.
<b>Provision</b>	<u>5.A.3 Streetscape Design</u> Intent: "To create an area adjacent to the street where landscaping and pedestrian amenities can be established to create a public open space that expresses a common theme, provides a link among projects, and emphasizes the concept that landscaping is a key element of Roseville's overall community image." "...When not already established by a specific plan or other document, and where practical given existing conditions, the minimum setback width for establishing a streetscape should be 20 feet, measured from the ultimate back of curb."
<b>Consistency</b>	<b>Yes, As Conditioned.</b> Under the WRSP, the segment of Phillip Road south of the site would become a private drive serving the REP and PGWWTP, and Phillip Road east of the site would be realigned to continue north instead of west. This section of Phillip Road would connect with Blue Oaks Boulevard to the north of the REP site, which would be extended west from Fiddymont Road. The three City-owned parcels that the REP site is part of are adjacent to these future roads. The AFC states that as an adjacent developer to the WRSP, RE would be responsible for landscaping within the landscape easements on the south side of Blue Oaks Boulevard, and the west side of Phillip Road. When staff asked in a data request when the applicant intended on planting this landscaping, RE responded that the City not RE would be planting the landscaping and that it would be installed as part of the build-out of the WRSP. Because the REP would be built within a 40-acre parcel that would the two future roads, and because it takes time for trees to grow, staff believes that landscaping should be installed around the four boundaries of the REP parcel (and outside the location of the travel lanes of the future roads) prior to the start of operation of the power plant so that by the time the WRSP is built out the trees would have grown to provide substantial screening of the power plant as seen from nearby roads, residential areas, and parklands in the WRSP area. If the landscaping was planted prior to project operation it would also reduce, over time, the adverse visual impacts on existing rural residences north of the site and travelers on Phillip Road. Thus, staff proposes Condition of Certification <b>VIS-2</b> to require RE to install landscaping around the four boundaries of the 40-acre REP property no later than the start of project operation.
<b>Provision</b>	<u>5.A.6 Grading</u> Intent: "To minimize the amount of cut and fill required to prepare a site for development and to preserve and accentuate the relationship between the natural features of the site and the proposed building."
<b>Consistency</b>	<b>Yes.</b> The REP will be cut and filled as required to provide a level site, situated slightly above the surrounding area. Consistent with this guideline, the applicant has stated that the amount of cut and fill will be the minimum amount necessary to achieve these objectives.
<b>Provision</b>	<u>5.A.7 Fencing</u> Intent: "To provide physical separation, security and privacy between projects and noise attenuation through the provision of appropriately placed and sized fences and walls." "...Industrial sites that abut residential areas shall provide a minimum six foot high masonry wall along the boundary..."
<b>Consistency</b>	<b>Yes.</b> The project is not adjacent to existing or future residential areas so a

**Visual Resources Table 5**  
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	masonry wall is not necessary. For security purposes, the project site would be surrounded by an eight foot high chain link fence. Staff's proposed Condition of Certification <b>VIS-5</b> would ensure that project fences are consistent with this guideline.
<b>Provision</b>	<u>5.A.8 Storage</u> "Outdoor storage in industrial projects should be located to minimize visibility from public ways by utilizing landscaping and berming, building siting, screening, setbacks, and/or location."
<b>Consistency</b>	<b>Yes.</b> The site plan provided in the AFC does not identify any outdoor storage areas. The AFC states that storage areas within the power plant will be located to minimize visibility and screened from view of public areas. Staff's proposed Condition of Certification <b>VIS-5</b> would ensure that any outdoor storage areas are designed consistent with this guideline.
<b>Provision</b>	<u>5.A.10 Trash/Recycling</u> All refuse containers shall be placed within screened storage areas. Enclosure materials and color should be consistent with, and complimentary to, building materials and finishes.
<b>Consistency</b>	<b>Yes.</b> The site plan does not depict the location of refuse containers. Consistent with this guideline, the applicant has stated that all refuse containers would be screened by solid fencing or walls within the power plant. Colors and materials of the enclosures would match adjacent buildings or structures. Staff's proposed Condition of Certification <b>VIS-5</b> would ensure that trash/recycling areas are designed consistent with this guideline.
<b>Provision</b>	<u>5.A.11 Landscaping</u> Intent: To ensure that the characteristics of the site, with respect to soil type, topography, drainage patterns, and solar orientation are considered and incorporated into the landscape design, and to enhance the visual image of Roseville by preserving and creatively blending the native and introduced landscape.
<b>Consistency</b>	<b>Yes.</b> In the AFC the applicant stated their intent to use plant materials that are drought tolerant and acclimated to the climate and type of soil in the project area. Plants would be selected to visually blend in with the natural landscape surrounding the site and to meet the City's water efficient landscape criteria. Staff believes that more water intensive plants should also be considered in the plant palette given the availability of reclaimed water from the PGWWTP for irrigation. Condition of Certification <b>VIS-2</b> requires preparation and implementation of a landscape screening plan for the project.
<b>Provision</b>	<u>b. Parking Lot Shading and Planter Requirements</u> Intent: "To ensure the shading of parking lots and cars in the hot summer months to provide adequate planting and root zone space for shade trees, and to enhance the overall appearance of paved parking areas."
<b>Consistency</b>	<b>Yes.</b> In the AFC the applicant stated that trees would be planted around the project parking area to provide shade. <b>VIS-2</b> requires the preparation and implementation of a landscape plan that is consistent with City LORS.
<b>Provision</b>	<u>c. Landscape Screening:</u> Intent: "To encourage the creative use of landscaping for effective screening, buffering and softening of various site elements."
<b>Consistency</b>	<b>Yes.</b> In the AFC the applicant stated their intent to use primarily evergreen plant materials and to space plants appropriately to effectively screen the power plant.
<b>Provision</b>	<u>d. Landscape Maintenance</u> Intent: "To maintain the original appearance of the landscaping over the long term, to ensure the health of the introduced plant materials so they will reach their natural maturity and to preserve the visual image of the community."

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<b>Consistency</b>	<b>Yes.</b> In the AFC the applicant stated their intent that all installed landscaping would be professionally maintained per City of Roseville maintenance requirements. Trees would be pruned, re-guyed, berms rebuilt, weeds and trash removed, and the irrigation system repaired on a monthly basis. Condition of Certification <b>VIS-2</b> requires the landscaping to be maintained for the life of the project and maintenance activities reported in the Annual Compliance Report.
<b>Provision</b>	<u><b>B. ARCHITECTURAL GUIDELINES</b></u> <u><b>5.B.1 General Design Considerations</b></u> Intent: "To promote high quality building designs that consist of durable and maintainable materials, that provide an aesthetically pleasing appearance to the public view."
<b>Consistency</b>	<b>Yes.</b> Although not likely to be considered to have an "aesthetically pleasing appearance," the project structures would be painted or treated to visually blend with the surrounding environment, and surfaces would be treated to not create substantial glare. Staff's proposed Condition of Certification <b>VIS-4</b> would require that the project structures be repainted as necessary to maintain a high-quality appearance for the life of the project. The condition requires yearly reporting on activities taken to maintain the surface treatment of the project structures.
<b>Provision</b>	<u><b>5.B.3 Material and Finishes</b></u> Intent: "To ensure the incorporation of a compatible variety of material and colors in building designs."
<b>Consistency</b>	<b>Yes.</b> The project structures would be painted or treated to visually blend with each other and the surrounding environment.
<b>Provision</b>	<u><b>5.B.4 Screening</b></u> Intent: "To screen undesirable view from public roads, adjacent properties and areas open to the public in a manner that is integrated with the overall building design."
<b>Consistency</b>	<b>Yes, As Conditioned.</b> The project would be visible from Phillip Road and adjacent properties. In the future, the project would be visible from Blue Oaks Boulevard and the realigned Phillip Road, both of which would be constructed as part of the WRSP. The visual impact of the project would be adverse on nearby properties and roads, and would likely be considered an "undesirable" view that should be screened. Staff believes that prior to project operation RE should plant landscaping along the four boundaries of the REP property that would reduce the adverse visual impacts on existing viewers and substantially screen future views of the project from the WRSP area. Therefore, staff has proposed Condition of Certification <b>VIS-2</b> .
<b>Provision</b>	<u><b>5.B.5 Signage</b></u> Intent: "To encourage thoughtful, integrated design themes and styles for project signage that conforms to the Roseville Sign Ordinance."
<b>Consistency</b>	<b>Yes.</b> The AFC states that only the title of the power plant and the address of the project will be on the main identification sign, which will probably be wall-mounted on the south wall of the administration/control building, facing the street (existing alignment of Phillip Road). Furthermore, there will be very few directional signs, and the applicant is committed to designing them as unobtrusive as possible. Condition of Certification <b>VIS-5</b> would ensure that signs conform to the Roseville Sign Ordinance.
<b>Provision</b>	<u><b>C. LIGHTING GUIDELINES</b></u> Intent: "To improve the appearance of the City by creating livelier, friendlier, safer spaces through the artful illumination of buildings, streetscape, walkways, plazas, public art and other highlights."  "Lighting shall comply with the Building Security Ordinance, enhance safety and security, and should give consideration to energy efficiency, color rendition and

**Visual Resources Table 5  
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	overall effect.”
	Lighting sources should be thoughtfully located and shall have cut off lenses to avoid light spillage and glare on adjacent properties.
<b>Consistency</b>	<b>Yes.</b> The applicant intends on complying with the Building Security Ordinance. Lighting would only be used for safety, security and operational purposes. Lighting fixtures would be very durable being of an industrial design. All light fixtures would be equipped with hoods and/or cut-off lenses and directed downward to avoid light spillage onto adjacent properties. The applicant does not intend on using accent lighting to enhance buildings or major structures as this is an industrial project. Staff's proposed Condition of Certification <b>VIS-3</b> requires review and approval by Energy Commission staff of a lighting mitigation plan.

## RESPONSE TO PUBLIC AND AGENCY COMMENTS

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**Bruce Singer:** “I am a resident of West Roseville. I favor the construction of the Roseville Energy Park (REP). I believe it will be a great asset to the City, and will be a great support to the citizens. I suggest open ‘green-space’ and a public access park be created for some of the surrounding land. Trees, and burms [sic] around the REP to provide screening would be good, too.” Comment received by Public Advisor’s Office via an e-mail dated January 22, 2004.

**Staff Response:** *A brochure published in May 2003 by Roseville Electric describes uses of the 40-acre REP site in addition to the natural gas fired generation facility being reviewed by the Energy Commission. Roseville Electric also envisions building a large solar photovoltaic array and a Community Energy Center at the REP site. The conceptual illustration in the brochure appears to show the Community Energy Center situated in a park-like setting with trees, grassy areas, and a pond. The recently approved West Roseville Specific Plan includes several regional parks (including one that is 91 acres in size), numerous pocket parks, and passive open space areas that will serve recreational needs as West Roseville grows. Energy Commission staff is proposing that the applicant plant landscaping around the site perimeters to screen the REP. This “green space,” which could include berms in addition to trees and shrubs, would improve the appearance of the REP site and facility.*

## CONCLUSIONS AND RECOMMENDATIONS

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With effective implementation of REP’s proposed mitigation measures as described in the AFC and supplements thereto, and staff’s proposed conditions of certification, the proposed REP project would cause less than significant direct and cumulative visual impacts.

Although staff has found the visual impacts of the project to be less than significant on existing viewers, staff is concerned about the impacts of the project structures and water vapor plumes on future viewers in the West Roseville area. Staff is proposing that the applicant plant landscaping along the REP property boundaries prior to operation of the project so that by the time the WRSP is built out, the trees would have

grown to provide substantial screening of the project structures. At the PSA Workshop, Energy Commission staff would like to discuss with the City of Roseville planning staff whether they have concerns about the REP's visible plumes having a negative aesthetic impact on the WRSP. If the City planners are concerned, staff would like to discuss with Roseville Electric plume abatement options that would minimize the size and frequency of the plumes to achieve better compatibility with the future land uses.

Except for a few instances, staff can conclude that the project, as it is proposed in the AFC or as conditioned by staff, would be consistent with applicable visual resources-related LORS. There are a few instances where staff needs input from the City of Roseville to make a final determination of LORS conformance. The applicant stated in Data Response 42 that the City would be reviewing the REP and would submit a set of conditions of approval for the project for consideration by Energy Commission staff (CH2MHill 2004a). This information was expected in March 2004, but to date has not been received. Staff is hopeful that this information when received will also address the project's consistency with the City's visual resources-related policies so the City's input can be incorporated into the FSA.

Staff recommends that the Energy Commission adopt the following conditions of certification if it approves the project.

## **PROPOSED CONDITIONS OF CERTIFICATION**

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### **CONSTRUCTION LIGHTING**

- VIS-1** The project owner shall ensure that lighting for construction of the power plant is used in a manner that minimizes potential night lighting impacts, as follows:
- a) All lighting shall be of minimum necessary brightness consistent with worker safety and security;
  - b) All fixed position lighting shall be shielded/hooded, and directed downward and toward the area to be illuminated to prevent direct illumination of the night sky and direct light trespass (direct light extending outside the boundaries of the power plant site or the site of construction of ancillary facilities);
  - c) Wherever feasible and safe and not needed for security, lighting shall be kept off when not in use; and
  - d) If the project owner receives a complaint about construction lighting, the project owner shall notify the CPM and shall use the complaint resolution form shown in the General Conditions section of the Compliance Plan to record each lighting complaint and to document the resolution of that complaint. The project owner shall provide a copy of each complaint form to the CPM.

**Verification:** Within seven days after the first use of construction lighting, the project owner shall notify the CPM that the lighting is ready for inspection.

If the CPM notifies the project owner that modifications to the lighting are needed to minimize impacts, within 15 days of receiving that notification the project owner shall implement the necessary modifications and notify the CPM that the modifications have been completed.

Within 48 hours of receiving a lighting complaint, the project owner shall provide to the CPM a) a report of the complaint; b) a proposal to resolve the complaint; and c) a schedule for implementation of the proposal. The project owner shall provide a copy of the completed complaint resolution form to the CPM in the next Monthly Compliance Report.

## **LANDSCAPE SCREENING**

**VIS-2** The project owner shall provide landscaping along the four boundaries of the REP property that is effective in screening the proposed project from public views and is consistent with the City of Roseville Community Design Guidelines. Trees and other vegetation consisting of informal groupings of fast-growing evergreens shall be strategically placed and of sufficient density and height to effectively screen the majority of the project structures (excluding the stacks).

The project owner shall submit to the CPM for review and approval and simultaneously to the City of Roseville for review and comment a landscaping plan whose proper implementation will satisfy these requirements. The plan shall include:

- a) A detailed landscape, grading, and irrigation plan, at a reasonable scale that demonstrates how the screening requirements stated above shall be met;
- b) A list of proposed species, specifying installation sizes, growth rates, the expected times to maturity, the expected sizes at five years and at maturity, spacing, number, availability, and a discussion of the suitability of the plants for the site conditions and mitigation objectives;
- c) A detailed installation schedule that demonstrates installation of as much of the landscaping as early in the construction process as is feasible in coordination with project construction;
- d) Maintenance procedures, including any needed irrigation and a plan for routine annual or semi-annual debris removal for the life of the project; and
- e) A procedure for monitoring for and replacement of unsuccessful plantings for the life of the project.

The project owner shall not implement the plan until the project owner receives approval of the plan from the CPM. The planting must be completed by the start of commercial operation, and the planting must occur during the optimal planting season.



**Verification:** Prior to start of construction and at least 90 days prior to installing the landscaping, the project owner shall submit the landscaping plan to the CPM for review and approval and simultaneously to the City of Roseville for review and comment.

If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a plan with the specified revision(s) within 30 days of receiving notification that revision is required.

The project owner shall notify the CPM prior to start of operation and within seven days after completing installation of the landscaping, that the landscaping is ready for inspection.

The project owner shall report landscape maintenance activities, including replacement of dead or dying vegetation, for the previous year of operation in each Annual Compliance Report.

## **PERMANENT EXTERIOR LIGHTING**

- VIS-3** To the extent feasible and consistent with safety and security considerations, the project owner shall design and install all permanent exterior lighting such that a) lamps and reflectors are not visible from beyond the project site; b) lighting does not cause excessive reflected glare; c) direct lighting does not illuminate the nighttime sky; d) illumination of the project and its immediate vicinity is minimized, and e) the plan complies with local policies and ordinances. The project owner shall submit to the CPM for review and approval and simultaneously to the City of Roseville for review and comment a lighting mitigation plan that includes but is not necessarily limited to the following:
- a) Determination of location and direction of light fixtures shall take the lighting mitigation requirements into account.
  - b) Lighting design shall consider setbacks of project features from the site boundary to aid in satisfying the lighting mitigation requirements.
  - c) Lighting design shall incorporate fixture hoods/shielding, with light directed downward or toward the area to be illuminated.
  - d) Light fixtures that are visible from beyond the project boundary shall have cutoff angles that are sufficient to prevent lamps and reflectors from being visible beyond the project boundary, except where necessary for security.
  - e) All lighting shall be of minimum necessary brightness consistent with operational safety and security;
  - f) Lights in high illumination areas not occupied on a continuous basis (such as maintenance platforms) shall have (in addition to hoods) switches, timer switches, or motion detectors so that the lights operate only when the area is occupied; and
  - g) If the project owner receives a complaint about lighting, the project owner shall notify the CPM and shall use the complaint resolution form

shown in the General Conditions section of the Compliance Plan to record each lighting complaint and to document the resolution of that complaint. All records of lighting complaints shall be kept in the on-site compliance file. The project owner shall provide a copy of each completed complaint form to the CPM.

- h) The lighting plan shall describe proposed technical methods to address any lighting complaints.

**Verification:** At least 90 days prior to ordering any permanent exterior lighting, the project owner shall contact the CPM to discuss the documentation required in the lighting mitigation plan.

At least 60 days prior to ordering any permanent exterior lighting, the project owner shall submit to the CPM for review and approval and simultaneously to the City of Roseville for review and comment a lighting mitigation plan that describes the measures to be used and demonstrates that implementation of the plan will satisfy the requirements of the condition.

If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a plan with the specified revision(s) within 30 days of receiving notification that revision is required.

The project owner shall not order any exterior lighting until receiving CPM approval of the lighting mitigation plan.

Prior to commercial operation, the project owner shall notify the CPM that the lighting has been completed and is ready for inspection. If after inspection the CPM notifies the project owner that modifications to the lighting are needed, within 30 days of receiving that notification the project owner shall implement the modifications and notify the CPM that the modifications have been completed and are ready for inspection.

Within 48 hours of receiving a lighting complaint, the project owner shall provide to the CPM a) a report of the complaint; b) a proposal to resolve the complaint; and c) a schedule for implementation of the proposal. The project owner shall provide a copy of the completed complaint resolution form to the CPM within 30 days of complaint resolution, and retain a copy in the project owner's compliance file.

## **SURFACE TREATMENT OF PROJECT STRUCTURES AND BUILDINGS**

**VIS-4** Prior to the start of commercial operation, the project owner shall treat the surfaces of all project structures and buildings visible to the public such that a) their color(s) minimize(s) visual intrusion and contrast by blending with the landscape; b) their colors and finishes do not create excessive glare; and c) their colors and finishes are consistent with local policies and ordinances. Corrugated or embossed-type aluminum lagging shall be used where lagging would be visible offsite. Structures shall have embossed or corrugated surfaces where feasible. The transmission line conductors shall be non-

specular and non-reflective, and the insulators shall be non-refractive. The project owner shall submit for CPM review and approval, a specific surface treatment plan whose proper implementation will satisfy these requirements. The treatment plan shall include:

- a) A description of the overall rationale for the proposed surface treatment, including the selection of the proposed color(s) and finishes.
- b) A list of each major project structure, building, tank, pipe, and wall; the transmission line towers and/or poles; and fencing, specifying the color(s) and finish proposed for each. Colors must be identified by vendor, name, and number; or according to a universal designation system;
- c) One set of color brochures or color chips showing each proposed color and finish;
- d) One set of 11" x 17" color photo simulations at life size scale, of the treatment proposed for use on project structures, including structures treated during manufacture, from Key Observation Points 1 and 2, whose locations are shown on Figure 2 in the Staff Assessment;
- e) A specific schedule for completion of the treatment; and
- f) A procedure to ensure proper treatment maintenance for the life of the project.

The project owner shall not specify to the vendors the treatment of any buildings or structures treated during manufacture, or perform the final treatment on any buildings or structures treated in the field, until the project owner receives notification of approval of the treatment plan by the CPM. Subsequent modifications to the treatment plan are prohibited without CPM approval.

**Verification:** At least 90 days prior to specifying to the vendor the color(s) and finish(es) of the first structures or buildings that are surface treated during manufacture, the project owner shall submit the proposed treatment plan to the CPM for review and approval and simultaneously to the City of Roseville for review and comment.

If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a plan with the specified revision(s) within 30 days of receiving notification that revision is required.

Prior to the start of commercial operation, the project owner shall notify the CPM that surface treatment of all listed structures and buildings has been completed and they are ready for inspection, and shall submit one set of 11" x 17" color photographs taken from the same key observation points identified in (d) above.

The project owner shall provide a status report regarding surface treatment maintenance in the Annual Compliance Report. The report shall specify a): the condition of the surfaces of all structures and buildings at the end of the reporting year;

b) maintenance activities that occurred during the reporting year; and c) the schedule of maintenance activities for the next year.

## **FENCES, SIGNS, AND STORAGE, TRASH AND RECYCLING AREAS**

**VIS-5** The project owner shall ensure that fences, outdoor storage areas, and trash/recycling areas are designed and visually screened consistent with the City of Roseville Community Design Guidelines. Project signs shall be designed consistent with the City of Roseville Sign Ordinance. Signs required by safety regulations shall conform to the design criteria established by those regulations.

**Verification:** At least 60 days prior to construction of the power plant, the project owner shall provide to the CPM for review and approval, and simultaneously to the City of Roseville for review and comment, information that will demonstrate that fences, storage areas, trash/recycling areas, and signs will be designed consistent with City LORS.

The project owner shall not construct these elements of the project until the project owner receives approval of the submittal from the CPM.

If the CPM notifies the project owner that revisions are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

## REFERENCES

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- CH2MHill, Sacramento, California (CH2MHill) 2004a. Applicant's Responses to CEC Staff Data Requests 1 – 71. Submitted to the Docket on February 6, 2004
- City of Roseville. Environmental Impact Report for the West Roseville Specific Plan and Sphere of Influence Amendment. Prepared by EIP Associates for the City of Roseville. September 15, 2003.
- City of Roseville 2010 General Plan. November 18, 1992.
- City of Roseville Community Design Guidelines. Adopted December 6, 1995.
- City of Roseville Municipal Code, Title 19, Zoning.
- Roseville Electric, Roseville, California (Roseville) 2003a. Application for Certification Volumes I & II. Submitted to the Docket on October 30, 2003.
- Roseville Electric, Roseville, California (Roseville) 2003b. Supplement in Response to Data Adequacy Comments. Submitted to the Docket on December 8, 2003.
- Smardon, Richard C., James E. Palmer, and John P. Felleman. 1986. Foundations for Visual Project Analysis. John Wiley & Sons. New York.
- Walters, William, and Lisa Blewitt. Visible Plume Analysis for Roseville Energy Park. Modeling analysis prepared by William Walters and Lisa Blewitt of Aspen Environmental Group for Energy Commission staff. May 2004.

## **APPENDIX VR-1: STAFF'S VISUAL RESOURCES EVALUATION METHODOLOGY**

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Staff's analysis of potential impacts to Visual Resources caused by construction or operation of any power plant or related facility largely involves answering the four questions found in Appendix G of the CEQA Guidelines, under Aesthetics. The four questions that must be addressed regarding whether the potential impacts of a project are significant are:

1. Would the project have a substantial adverse effect on a scenic vista?
2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?
4. Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

The visual analysis typically distinguishes between three different impact durations: temporary impacts, typically lasting no longer than two years; short-term impacts, generally last no longer than five years; and long-term impacts, which are impacts with a duration greater than five years. In general, short-term impacts are not considered significant.

In addition to visiting the project area for personal observation of how and whether a particular view is experienced, staff also searches for other evidence to determine if the local community values a particular view that might be affected by the project. This includes searching the applicable planning documents covering the area produced by local governments and community groups, as well as searches for any other type of evidence showing whether valued scenic vistas exist within the project's viewshed. Staff relies primarily on personal observation of the project site to make initial determinations of visual character or quality of the area, in comparison with all other landscapes in California, but also gives due deference to official statements by elected governmental bodies concerning the value of visual resources within the project area.

Staff answers each of the four checklist questions for each part of the project both during construction and during operation, including any related facility such as a transmission line or gas pipeline. To answer the first checklist question (Would the project have a substantial adverse effect on a scenic vista?), staff must determine if any such scenic vista exists within the viewshed of the various aspects of the project, and then determine if the project would have a substantial adverse effect on that vista. To help make these determinations, visual resource professionals often answer a series of questions developed to help focus the analysis, and examine various ways that the project could create an impact to scenic vistas. The Energy Commission's Visual Resources staff has developed such a list for each of the four CEQA guideline questions, drawing upon published methodologies and academic resources (Smardon, et al.), as well as on past experience with other power plant siting cases. Questions

developed to help determine whether the project would significantly affect a scenic vista include:

1. Is the project located in the scenic view of a local/state/federal-designated scenic vista?
2. Is there compelling evidence to show that the view is designated/valued by the local community?
3. Would the project create frequent visible water vapor plumes that could have an adverse effect on a state/federal/local-designated scenic vista?
4. Will the project eliminate or block views of valuable visual resources?

To help answer the second CEQA checklist question (Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?), staff developed the following sub-questions:

1. Is the project located in the scenic view from a local/state/federal-designated scenic highway?
2. Would the project create frequent visible plumes that could have an adverse effect on the view from a local/state/federal-designated scenic highway?
3. Does the project site or its immediate vicinity contain scenic resources, such as trees, rock outcroppings, or historic structures that could be damaged by the project?

To answer the third question (Would the project substantially degrade the existing visual character or quality of the site and its surroundings?), staff assesses the existing visual character and quality of the project area, and then determines how the project would affect the character and quality of the project viewshed. To assess whether the project has the potential to substantially degrade the present visual character or quality, staff uses personal observation and such tools as visual simulations to determine if an impact is significant and mitigation is required to reduce the impact to a less-than-significant level. To make that determination, staff examines many factors, such as: how many viewers can see a particular view and for how long, collectively called “viewer exposure”; and to what degree would the project change the aspects of a given view, such as whether the project’s components would block a particular view.

To help determine how the community rates and values the visual character and quality of a given site, and whether the project would substantially alter the present visual character or quality, staff developed the following sub-questions:

1. Is the project site zoned for industrial uses?
2. Is a conditional use permit and/or height variance required from the city/county (if so what conditions would the city/county place on the power plant)?
3. Does the project conform to the clear written declarations of local/state/federal agencies to protect designated visual resources of importance or the valued aesthetic character of a neighborhood (said declaration must be clear, concise, and

uncompromised by conflicting declarations, and be an official action of the governing body (City Council/Board of Supervisors) such as a General Plan element, zoning ordinance, or design guideline)?

4. Will the project substantially alter the existing viewshed, including any changes in natural terrain?
5. How many residential, recreational, and traveling (motorist) viewers have views of the project?
6. Does the project's degree of visual contrast, dominance, and view blockage exceed acceptable levels given the viewing characteristics of the existing setting?
7. Would the project create frequent visible plumes that could have an adverse effect on the view from a KOP?
8. Will the project deviate substantially from the form, line, color, and texture of existing elements of the viewshed that contribute to visual quality?
9. Has the applicant proposed landscaping?

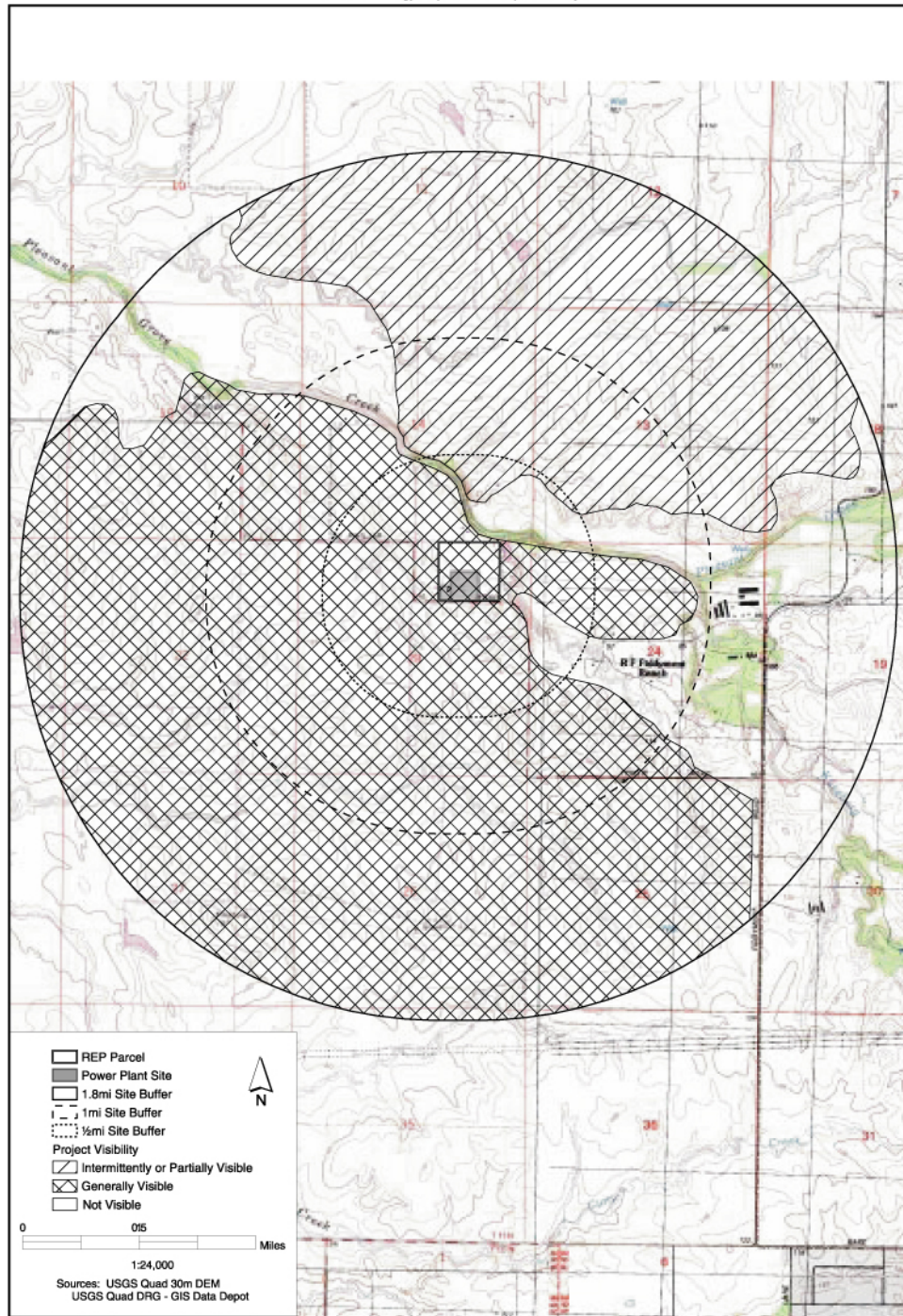
The process of answering these questions includes an examination of the present views within the project viewshed in terms of aesthetics – i.e., by examining the various aspects that together define the quality of a view – followed by an assessment of how the various aspects of the aesthetics of the view would be affected by the project, which conversely could be described as an analysis of how well the project area can absorb the various aspects of the project into the landscape.

To answer the fourth CEQA Guidelines checklist question (Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?), staff analyzes the project's lighting proposals to ensure they fit with established norms for low-impact lighting designs, and then answers the following sub-questions to determine if a potential for impact from night-lighting exists:

1. With the Energy Commission's typical condition of certification for lighting control, would light or glare be reduced to acceptable levels?
2. Will the project result in significant amounts of backscatter light into the nighttime sky?

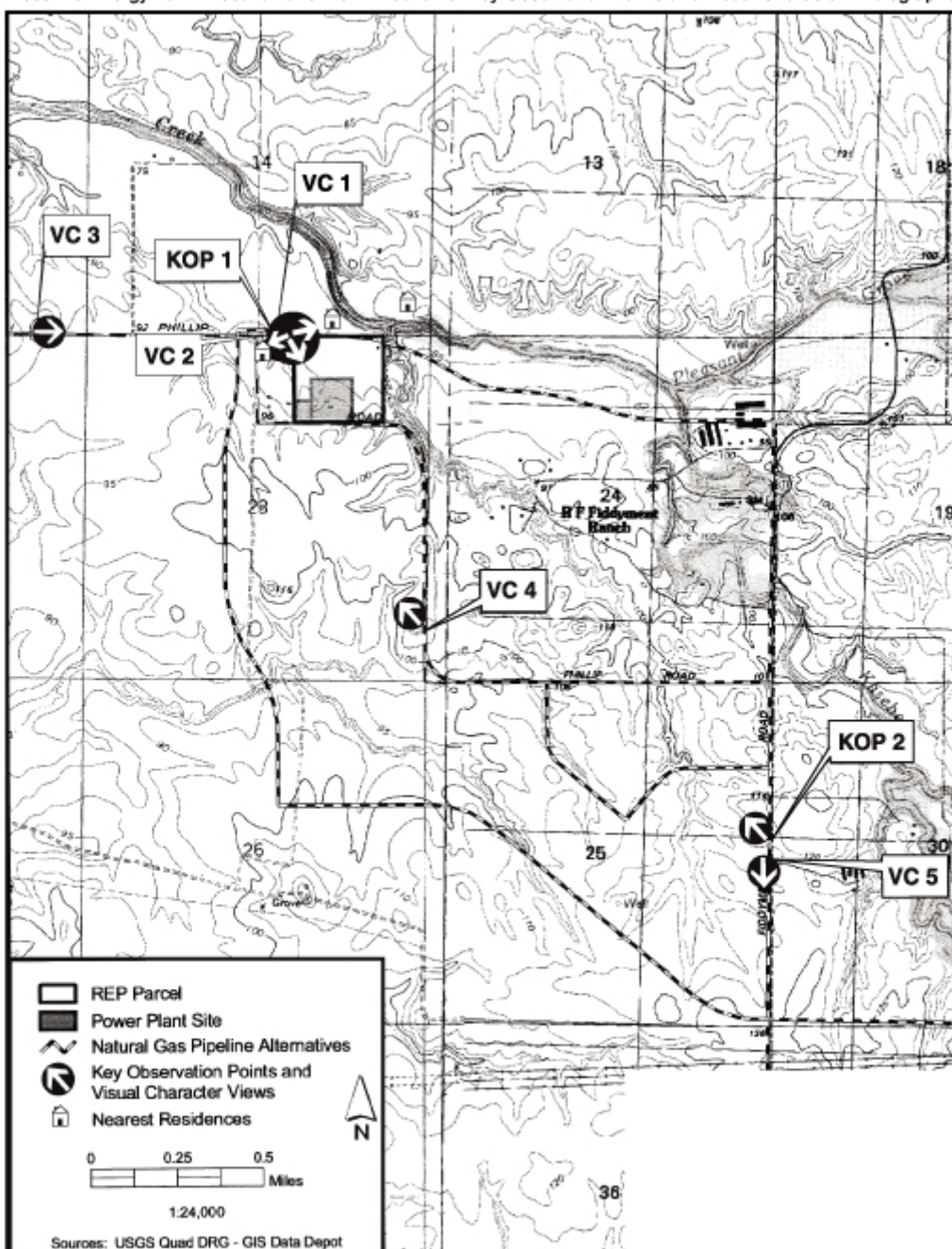


**VISUAL RESOURCES- FIGURE 1**  
 Roseville Energy Project - REP Project Visibility



# **VISUAL RESOURCES - FIGURE 2**

Roseville Energy Park - Location and View Direction of Key Observation Points and Visual Character Photographs



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2004  
SOURCE: AFC Figure 8.13-2

JUNE 2004

VISUAL RESOURCES



**VISUAL RESOURCES - FIGURE 3**  
Roseville Energy Center - Visual Character Photographs



**VC 1**

Residence located north of the project site, looking northeast from northwest corner of REP parcel.

Source: AFC Figure 8.13-4



**VC 2**

View to west looking at Residence and Dog Kennel on Phillip Road from northwest corner of REP parcel.

Source: CEC Staff Photograph



**VC 4**

The PGWWTP, looking northwest from Phillip Road.

Source: AFC Figure 8.13-3



**VC 3**

View east towards project site along Phillip Road (kennel at left, REP site at left of center, PGWWTP at the right).

Source: AFC Figure 8.13-5



**VC 5**

View south along Fiddymont Road, Del Webb Sun City landscape buffer at left.

Source: AFC Figure 8.13-6

**VISUAL RESOURCES - FIGURE 4A**

Roseville Energy Park - KOP 1 - Existing View of the REP Site, Looking Southeast from the Northwest Corner of the REP Parcel



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2004  
SOURCE: AFC Figure 8.13-7a



**VISUAL RESOURCES - FIGURE 4B**  
Roseville Energy Park - KOP 1 - Simulated View of the REP Project



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2004  
SOURCE: AFC Figure 8.13-7b

**VISUAL RESOURCES - FIGURE 5A**

Roseville Energy Park - KOP 2 - Existing View Looking Northwest Toward REP Site from Fiddymont Road, South of Del Webb Boulevard



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2004  
SOURCE: AFC Figure 8.13-8a



**VISUAL RESOURCES - FIGURE 5B**  
Roseville Energy Park - KOP 2 - Simulated View of the REP Project



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2004  
SOURCE: AFC Figure 8.13-8b

# WASTE MANAGEMENT

Ellie Townsend-Hough

## INTRODUCTION

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This Waste Management analysis examines the issues associated with managing wastes generated from constructing and operating the proposed Roseville Energy Park (REP). Staff evaluated the proposed waste management plans and mitigation measures designed to reduce the risks and environmental impacts associated with handling, storing, and disposing of project-related hazardous and nonhazardous wastes. The technical scope of this analysis encompasses wastes generated during facility construction and operation. Wastewater is more fully discussed in the **Soil and Water Resources** section of this document.

Energy Commission staff's objectives in its waste management analysis are to ensure that:

- The management of the wastes will be in compliance with all applicable laws, ordinances, regulations, and standards (LORS). Compliance with LORS ensures that wastes generated during the construction and operation of the proposed project will be managed in an environmentally safe manner; and
- The disposal of project wastes will not result in significant adverse impacts to existing waste disposal facilities.

## LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

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### FEDERAL

#### **Resource Conservation and Recovery Act (42 U.S.C. § 6922)**

Resource Conservation and Recovery Act (RCRA) establishes requirements for the management of hazardous wastes from the time of generation to the point of ultimate treatment or disposal. Section 6922 requires generators of hazardous waste to comply with requirements regarding:

- record keeping practices which identify quantities of hazardous wastes generated and their disposition;
- labeling practices and use of appropriate containers;
- use of a manifest system for transportation; and
- submission of periodic reports to the U.S. Environmental Protection Agency (U. S. EPA) or authorized state agency.

#### **Title 40, Code of Federal Regulations, part 260**

These sections contain regulations promulgated by the EPA to implement the requirements of RCRA as described above. Characteristics of hazardous waste are



described in terms of ignitability, corrosivity, reactivity, and toxicity; and specific types of wastes are listed.

## **STATE**

### **California Health and Safety Code §25100 et seq. (Hazardous Waste Control Act of 1972, as amended)**

This act creates the framework under which hazardous wastes must be managed in California. It mandates the State Department of Health Services (now the Department of Toxic Substances Control (DTSC) under the California Environmental Protection Agency, or Cal EPA) to develop and publish a list of hazardous and extremely hazardous wastes, and to develop and adopt criteria and guidelines for the identification of such wastes. It also requires hazardous waste generators to file notification statements with Cal EPA and creates a manifest system to be used when transporting such wastes.

### **Title 14, California Code of Regulations, §17200 et seq. (Minimum Standards for Solid Waste Handling and Disposal)**

These regulations set forth minimum standards for solid waste handling and disposal, guidelines to ensure conformance of solid waste facilities with county solid waste management plans, as well as enforcement and administration provisions.

### **Title 22, California Code of Regulations, §66262.10 et seq. (Generator Standards)**

These sections establish requirements for generators of hazardous waste. Under these sections, waste generators must determine if their wastes are hazardous according to either specified characteristics or lists of wastes. As in the federal program, hazardous waste generators must obtain EPA identification numbers, prepare manifests before transporting the waste off-site, and use only permitted treatment, storage, and disposal facilities. Additionally, registered hazardous waste transporters must only handle hazardous waste. Generator requirements for record keeping, reporting, packaging, and labeling are also established.

### **Title 22, California Code of Regulations, §67100.1 et seq. (Hazardous Waste Source Reduction and Management Review)**

These sections establish reporting requirements for generators of certain hazardous and extremely hazardous wastes in excess of specified limits. The required reports must indicate the generator's waste management plans and performance over the reporting period.

## **LOCAL**

The Placer County Department of Health and Human Services has the responsibility for administration and enforcement of the California Integrated Waste Management Act for non-hazardous solid waste at the proposed REP.

The REP must also comply with the Roseville Fire Department, which will govern the storage and use of hazardous materials and wastes per Fire Code requirements. The

Roseville Hazardous Materials Emergency Response Unit is responsible for emergency spills, containment and cleanup (Roseville 2003a pp. 8.14-14 – 8.14-15).

## **SETTING**

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### **PROJECT AND SITE DESCRIPTION**

The proposed REP would be located on 12 acres of a 40-acre parcel of land in the City of Roseville in Placer County. The site is located adjacent to and north of Roseville's Pleasant Grove Waste Water Treatment Plant (PGWWTP). The major components of the proposed REP project are a 160-megawatt (MW) combined-cycle generating facility configured using two natural-gas-fired combustion turbines, one steam turbine, two heat recovery steam generators, a cooling tower, and selective catalytic reduction. REP proposes to construct a six-mile, 10 to 16-inch natural gas pipeline. The PGWWTP would supply the proposed project with recycled water to be used for cooling tower make-up (Roseville 2003a, Section 2.0).

The REP parcel is not developed and is sparsely vegetated. The site was once used for rural residential purposes and grazing. A construction staging and laydown area for the PGWWTP is now located on the proposed site. The proposed pipeline route would be developed along Fiddymment Road between Baseline Road and Phillip Road. The pipeline route is mostly residential on the east side of Fiddymment and entirely agricultural on the west side. Residential uses include a small amount of high-density and medium-density residential, as well as low-density residential, including Del Webb Sun City Roseville north of Pleasant Grove Boulevard. Agricultural uses include grazing and some crop growing for hay (Roseville 2003a p. 8.6-8).

There were three Phase I and one Phase II Environmental Site Assessments (ESA) performed according to the American Society for Testing and Materials (ASTM) Standard E 1527 for the area surrounding and including the proposed project site included in this AFC. The ESAs were performed for the PGWWTP and the proposed project site. The ESAs were completed by Earthtec Ltd on January 7, 1999, Anderson Consulting Group on April 6, 1999, URS in August 2001, and Tetra Tech in September 2003 (Roseville 2003a Appendix 8.14).

The four combined ESAs reviewed parcels assigned Assessor's Parcel Numbers (APN): 17-100-15, -17, -18, -20, -27, -28, -29, -30, -31, -34, and -35. The REP project site includes portions of (APN): 17-100-17, -18, -29, -30, and -31. The purpose of the investigations was to identify recognized environmental conditions at the project sites (CH2MHill 2004e). The applicant completed a Roseville Energy Park Corridor Study Report (CSR) in February 2004. Staff conducted an additional site reconnaissance along all accessible portions of the proposed natural gas pipeline route on March 29, 2004. The ESAs did not indicate any significant contamination (Roseville 2003a Appendix 8.14). Staff investigated the pipeline route to verify that no new businesses such as dry cleaners, car dealerships, etc. were established during or after the Phase I ESAs that might change the ESA conclusions. Staff found no new businesses or any unexpected structures along the route during the reconnaissance.

## IMPACTS

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### PROJECT SPECIFIC IMPACTS

#### **Construction**

Site preparation and construction of the proposed plant and associated facilities would generate both nonhazardous and hazardous wastes in solid and liquid forms.

#### **Nonhazardous Solid Wastes**

Nonhazardous solid wastes anticipated to be generated during construction are detailed in Section 8.14.2.1 of the AFC (REP 2003a). Approximately 50 tons of wood, paper, glass and plastics, 30 tons of excess concrete and 10 tons of scrap metal could be generated during project construction. Wherever possible and practical, these wastes would be recycled, particularly the paper products and metals. Nonrecyclable wastes would be collected and disposed of in a Class III landfill. A possible exception might include the disposal of the waste concrete in a clean fill site if one is available.

Drilling will be necessary to install the natural gas and water pipelines. Two hundred tons of drilling mud, which consists of nontoxic bentonite clay, will be used to lubricate and cool the drilling bit. The drilling mud will be tested before disposal at a Class II or III landfill (Roseville 2003a Section 8.14.2.1).

#### **Nonhazardous Liquid Wastes**

Nonhazardous liquid wastes would be generated during construction. These liquid wastes include sanitary wastes, equipment washwater, stormwater runoff, and wastewater from the gas pipeline hydrotesting process (Roseville 2003a p. 8.14-3). If excavation dewatering occurs, additional nonhazardous wastewater would be generated.

Sanitary waste would be collected in portable toilet facilities. Equipment washwater would be contained at the designated wash sites and disposed of offsite. Stormwater runoff will be managed according to an approved plan developed by the construction contractor and is discussed in more detail in the **Soil and Water Resources** section of this document. Wastewater resulting from the hydrostatic test of the gas pipeline would be filtered to remove sediment and welding fragments, and then tested for contaminating components. The construction contractor would discharge non-contaminated hydrotesting water to an existing storm sewer along the pipeline corridor per applicable regulations.

#### **Hazardous Wastes**

Hazardous wastes anticipated to be generated during construction are discussed in Section 8.14.2.1 of the AFC. Solid hazardous wastes may include spent welding materials and dried paint. Liquid hazardous wastes would include waste solvents along with flushing, cleaning and passivating (nitrate or phosphate solution) fluids. Minimal quantities of the solid wastes and solvents are anticipated. The liquid flushing, cleaning

and passivating wastes would be generated in quantities estimated at one to two times the internal volumes of the pipes being cleaned (Roseville 2003a Section 8.14.2.1).

The construction contractor would be considered the generator of hazardous wastes at this site during the construction period and would be responsible for proper waste handling, storage, disposal, record keeping, and employee training. Solid hazardous wastes along with liquid wastes (except for the flushing wastes referred to above which will be temporarily stored on-site in portable tanks and disposed off-site) would be accumulated at satellite locations and then transported daily to the 90-day storage area located at the site construction laydown area. The wastes thus accumulated would be removed from the site and transported by a certified collection company to a permitted transfer, storage and disposal (TSD) facility prior to the expiration of the 90-day limit (Roseville 2003a Section 8.14.2.1).

## **Operation**

The proposed REP would generate both nonhazardous and hazardous wastes in solid and liquid forms under normal operating conditions.

### **Nonhazardous Solid Wastes**

Nonhazardous solid wastes generated during plant operation are expected to include rags, turbine air filters, machine parts, electrical materials, empty containers, and typical worker and small office wastes. Approximately 30 cubic yards of these wastes would be generated annually. Large metal parts would be recycled (REP 2003a, p. 8.13-6).

### ***Zero Liquid Discharge System***

In order to reduce and reuse wastewater in the plant, REP proposes to implement a zero-liquid discharge (ZLD) system for the proposed project (Roseville 2003a Section 8.14.2.2).

The ZLD system would include a brine concentrator system, crystallizer system, and associated equipment such as tanks and pumps. The ZLD system would be designed to process all of the wastewater produced by the plant's primary wastewater system, returning a relatively high quality distillate stream for reuse in the plant and producing a solid waste stream (salt cake). Wastewater would be processed in two steps. The first would be a brine concentrator, which would concentrate the wastewater to produce a clean distillate stream. The second step would further process the remaining wastewater, producing another clean distillate stream and the salt cake.

The operation of the ZLD system would result in a generation of approximately 867 tons per year of salt cake (Roseville 2003a, p. 8.13-6), which would require disposal (Roseville 2003a, p. 8.14-4). Testing was done for similar ZLD systems in support of the Three Mountain Project and Pastoria Energy Facility siting cases in order to determine if the wastes might be classified as hazardous. Analyses of the solid wastes similar to those that would be generated from the softener, as well as the crystallizer, indicated that all metals of concern were below California regulatory limits that define hazardous waste (Ogden 2000a and PEF/Thompson 2000f). In order to ensure the correct classification of such wastes from the proposed project, however, staff proposes Condition of Certification **WASTE-7**, which would require testing of the salt cake.

Although the solid waste generated from the crystallizer may not be classified as hazardous, it might be considered a California designated waste due to its high salt content. The category of designated waste includes nonhazardous waste that contains pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations that could exceed applicable water quality objectives or affect the beneficial uses of waters of the state (Cal. Code Regs., tit. 27, § 20210). Designated wastes are required to be disposed of at Class I or Class II disposal sites. However, a designated waste can be discharged to a Class III disposal site if it can be demonstrated that there is a lower risk to water quality than indicated by the “designated waste” classification.

The effluent from the brine concentrator would be piped to the crystallizer for further concentration as typically done in ZLD systems (Roseville 2003a Section 7.4.1.1). Secondary materials (such as the effluent) that are reclaimed and returned in a closed system to the original process in which they were generated where they are reused (in this case, as plant process water) are exempt from management as hazardous wastes (Cal. Code Regs., tit. 22, § 66261.4(a)(5)(A)). Thus, because the effluent would be recycled in a closed system, it would not require hazardous waste testing nor would a permit be required from DTSC. Construction and operation of the zero liquid discharge system would not have any significant effects on any of the other waste streams generated at REP.

### **Hazardous Wastes**

Hazardous wastes anticipated to be generated during routine project operation include waste lubricating oil, used oil filters, laboratory waste, selective catalytic reduction (SCR) and oxidation catalysts, oily rags and absorbents, and used acidic and alkaline chemical cleaning wastes (potentially containing high concentrations of heavy metals). Table 8.14.1 in the AFC ((Roseville 2003a p. 8.14-6) lists the anticipated hazardous wastes (except the cleaning solutions) along with their origin, composition, estimated quantity, hazard class, and disposal method. Most of the wastes would be generated in relatively small quantities and would be recycled by certified recyclers. For example, all the lubricating oil, totaling approximately 2,500 gallons per year, would be recycled. The emission control catalyst would require replacement every three to five years, resulting in the generation of a total of 25,000 pounds of waste material that could require disposal in a Class I facility if recycling or regeneration proves not to be feasible. Chemical materials collected in drains as a result of spillage, overflows, and maintenance operations will be neutralized onsite (if necessary) and directed into the cooling tower basin. Four hundred gallons per year of sulfuric acid will be used in water treatment. In addition, Table 8.14-1 of the AFC ((Roseville 2003a p. 8.14-6) notes that up to 80 pounds per year of cooling tower sludge will normally require disposal in a Class II facility, but could sometimes require disposal as a hazardous waste.

### **IMPACT ON EXISTING WASTE DISPOSAL FACILITIES**

Nonhazardous waste disposal sites suitable for discarding project-related construction and operation wastes are identified in Section 8.14.3 of the AFC (REP 2003a). During construction of the proposed project, 290 tons of nonhazardous will be generated. This would consist of 50 tons of paper, wood, and plastic; 30 tons of concrete; 10 tons of

metal; and 200 tons of drilling mud. The nonhazardous solid wastes generated yearly at the REP would be recycled if possible, or disposed of in a Class III landfill. Thirty cubic yards per year of miscellaneous wastes, rags, machine parts, etc are projected to be generated throughout operation of the plant. During operation, another 867 tons per year of salt cake would also be generated and require disposal at a Class I or II landfill, depending upon the results of toxicity testing.

Section 8.14.1 (Roseville 2003a p. 8.14-7) notes that City of Roseville's Solid Waste Division provides collection services for removal of solid waste from the proposed project site. The nonhazardous solid waste will be deposited in either the Western Placer Waste Management Authority Materials Recovery Facility for recycling or the Western Regional Sanitary Landfill (Roseville 2003a p. 8.14-7). The total amount of nonhazardous waste generated from project construction and operation will contribute less than one percent of available landfill capacity. Staff finds that disposal of the solid wastes generated by the REP can occur without significantly impacting the capacity or remaining life of any of these facilities.

Section 8.14.3.2 of the AFC lists three Class I landfills. The three Class I landfills in California are: the Clean Harbors Buttonwillow Landfill in Kern County, the Clean Harbors Westmorland Landfill in Imperial County, and the Waste Management Landfill in King's County. There are 37 offsite hazardous waste treatment and recycling facilities in California capable of handling various portions of the facility's hazardous waste. Together, the two Safety-Kleen facilities and the Kettleman Hills facility possess an excess of 11.8 million cubic yards of remaining hazardous waste disposal capacity, with remaining operating lifetimes up to the year 2040. It is estimated that 867 tons per year of salty cake will be generated during operation of the ZLD. Thus, even if the salt cake were to be placed in a Class I facility, no significant impact on waste disposal facilities would occur.

## MITIGATION

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In section 8.14.4 of the AFC (Roseville 2003a p. 8.14-9), the applicant states that the handling and management of wastes at the proposed REP facility would follow the hierarchical approach described in the following order of preference from greatest to least:

1. source reduction through pollution prevention measures;
2. recycling or reusing waste materials;
3. treatment to render the waste nonhazardous such as through neutralization; and
4. disposal of only those wastes that cannot be reduced treated or recycled.

Sections 8.14.4.1 and 8.14.4.2 of the AFC (Roseville 2003a) discuss waste management measures REP would employ during the construction and operation phases to manage and mitigate the impacts of the generation of liquid and solid non-hazardous and hazardous wastes.

Staff has proposed Conditions of Certification **WASTE-1** through **-7** which require that: 1) the project owner have an experienced Registered Professional Engineer or Geologist available for consultation during soil excavation and grading activities in the event that contaminated soils are encountered; 2) if potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities, the Registered Professional Engineer or Geologist shall inspect the site, determine the need for sampling, file a written report, and seek guidance from the Compliance Project Manager (CPM) and the appropriate regulatory agencies; 3) the project owner obtain a unique hazardous waste generator identification number from the Department of Toxic Substances Control (DTSC) in accordance with DTSC regulatory authority; 4) the project owner notify the CPM whenever the owner becomes aware of any impending waste management-related enforcement action; 5) the project owner prepare and submit waste management plans for all wastes generated during construction and operation of the facility and submit them to the CPM and the local agency; 6) the project owner provide hazardous waste recognition training to workers; and 7) the project owner test the salt cake product from the crystallizer for the presence of hazardous levels of metals.

## **COMPLIANCE WITH APPLICABLE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)**

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The applicant is required to dispose of hazardous and non-hazardous wastes at facilities approved by the California Department of Toxic Substances Control (DTSC). Because hazardous wastes would be produced during project construction and operation, both the REP and its construction contractor would be required to obtain hazardous waste generator identification numbers from the DTSC. Accordingly, both REP and its construction contractor would be required to properly store, package and label waste, use only approved transporters, prepare hazardous waste manifests, keep detailed records and appropriately train their employees. Pursuant to California Code of Regulations, Title 22, section 67100.1 et seq., a hazardous waste Source Reduction and Evaluation Review and Plan may be required to be prepared by the REP.

## **CUMULATIVE IMPACTS**

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As proposed, the quantities of nonhazardous and hazardous wastes generated during construction and operation of the REP project would add to the total quantities of waste generated in Placer County and the State of California. However, because (a) the waste would be generated in small quantities, (b) recycling efforts would be prioritized wherever practical, and (c) capacity is available in a variety of disposal facilities, these added quantities would not result in significant waste management impacts to any hazardous or nonhazardous landfill.

This facility would generate an estimated 290 tons of solid waste during construction and 30 cubic yards (equivalent to 30 tons or less) per year during operation. For comparative purposes, the Integrated Waste Management Board Jurisdiction Disposal and Alternative Daily Coverage (ADC) WebPages list the amount of solid waste disposed of in Placer County as 263,784 tons in 2002 (IWMB 2004). REP's contribution will represent less than one percent of total county waste generation. The amount of

solid waste anticipated to be generated by the proposed facility constitutes an insignificant increase to this total.

## **FACILITY CLOSURE**

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Section 8.14.4.3 of the AFC (Roseville 2003a) discusses REP's responsibilities for waste management in the event of a temporary facility closure due to a disruption in the supply of natural-gas fuel or damage to the facility due to a natural disaster or permanent closure due to a cessation of operations. The applicant indicates that a contingency plan for temporary closure will be prepared prior to facility startup. In addition, a Risk Management Plan (AFC Section 8.12.8.4) will be established containing additional procedures to be followed in the event of temporary closure due to plant damage or the possible release of a hazardous waste or material into the environment.

During any type of facility closure (see staff's **General Conditions** section which discusses planned, unexpected temporary, and unexpected permanent closure), the primary waste management related concern is that project wastes not pose any potentially significant problem to the public, workers, or the environment. Staff believes that conditions of certification in the **General Conditions** section would adequately address waste management issues related to closure.

In the case of unexpected temporary closure, waste management practices normally required by LORS and already in-place (such as limiting hazardous waste accumulation time to 90 days and requiring proper containment) would be adequate to avoid significant problems. In addition, staff's **General Conditions** for Facility Closure require preparation of an on-site contingency plan, which shall provide for removal of hazardous wastes and draining of all chemicals from storage tanks and other equipment for temporary closures exceeding 90 days.

An approved on-site contingency plan is also required to protect public health and safety in the case of unexpected permanent closure. As above, the plan must provide for the removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment.

For planned permanent closure, REP would develop a facility General Closure Plan at least twelve months prior to commencement of closure and is committed to complying with LORS that are applicable at the time of closure. The applicant indicates (see AFC Section 8.14.4.3) that such a closure plan would emphasize the maximum recycling of facility components and 24-hour site security.

## **RESPONSE TO PUBLIC AND AGENCY COMMENTS**

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### **AGENCY COMMENTS**

The Department of Toxic Substances Control reviewed the AFC and submitted comments and participated in the development of Data Requests 70 and 71 (Gillette 2004a). The data requests called for a Phase I ESA for the pipeline to be provided by the applicant (CH2MHill 2004a). The applicant provided an Environmental Data



Resources, Inc. Corridor Study Report and Energy Commission staff completed an additional site survey (CH2MHill 2004a). Another data request requested historical background of the agricultural areas. The applicant provided aerial photographs of the proposed project site.

The DTSC representative is satisfied that the applicant provided adequate information on both data requests and that there are not outstanding issues with the project (Gillette 2004b).

## CONCLUSIONS AND RECOMMENDATIONS

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Staff has determined that the applicant's waste management plan for the proposed REP would allow for compliance with LORS designed to minimize the potential for human health and environmental effects and will not cause a significant direct, or indirect, cumulative adverse impact.

To ensure implementation of all necessary mitigation measures, staff recommends adoption of the conditions of certification listed below.

## CONDITIONS OF CERTIFICATION

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**WASTE-1** The project owner shall provide the resume of a Registered Professional Engineer or Geologist, who shall be available for consultation during soil excavation and grading activities, to the CPM for review and approval. The resume shall show experience in remedial investigation and feasibility studies.

The Registered Professional Engineer or Geologist shall be given full authority by the project owner to oversee any earth moving activities that have the potential to disturb contaminated soil.

**Verification:** At least 30 days prior to the start of site mobilization the project owner shall submit the resume to the CPM.

**WASTE-2** If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the Registered Professional Engineer or Geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner and CPM stating the recommended course of action.

Depending on the nature and extent of contamination, the Registered Professional Engineer or Geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If, in the opinion of the Registered Professional Engineer or Geologist, significant remediation may be required, the project owner shall contact representatives of the Regional Water Quality Control Board (as appropriate), the Roseville Fire Department, and the Sacramento Office of the

California Department of Toxic Substances Control for guidance and possible oversight.

**Verification:** The project owner shall submit any final reports filed by the Registered Professional Engineer or Geologist to the CPM within five days of their receipt. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

**WASTE-3** The project owner shall obtain a hazardous waste generator identification number from the Department of Toxic Substances Control prior to generating any hazardous waste.

**Verification:** The project owner shall keep its copy of the identification number on file at the project site and notify the CPM via the Monthly Compliance Report of its receipt.

**WASTE-4** Upon becoming aware of any impending waste management-related enforcement action by any local, state, or federal authority, the project owner shall notify the CPM of any such action taken or proposed to be taken against the project itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts.

**Verification:** The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the manner in which project-related wastes are managed.

**WASTE-5** The project owner shall prepare a Construction Waste Management Plan and an Operation Waste Management Plan for all wastes generated during construction and operation of the facility, respectively, and shall submit both plans to the CPM for review and approval. The plans shall contain, at a minimum, the following:

- A description of all waste streams, including projections of frequency, amounts generated and hazard classifications; and
- Methods of managing each waste stream, including treatment methods and companies contracted with for treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/reduction plans.

**Verification:** No less than 30 days prior to the start of site mobilization, the project owner shall submit the Construction Waste Management Plan to the CPM.

The operation waste management plan shall be submitted to the CPM no less than 30 days prior to the start of project operation. The project owner shall submit any required revisions within 20 days of notification by the CPM.

In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to the planned management methods.

**WASTE-6** Prior to any earth moving activities, employees shall receive hazardous waste-related training that focuses on the recognition of potentially contaminated soil and/or groundwater and contingency procedures to be followed as specified in **WASTE-2** above. Training shall comply with Hazardous Waste Operations (8 CCR 5192) and Hazard Communication (8 CCR 5194) requirements as appropriate.

**Verification:** The project owner shall notify the CPM via the monthly compliance report of completion of the hazardous waste training program.

**WASTE-7** The project owner shall test the salt cake product from the crystallizer for the presence of hazardous levels of metals. If levels are below ten times the Soluble Threshold Level Concentration as listed in Title 22, California Code of Regulations, section 66261.24, then future testing is not required unless there is a substantial change in the wastewater treatment process. If not classified as a hazardous waste, the project owner shall manage the salt cake product appropriately as a nonhazardous or designated waste unless it is sold as a commercial product.

**Verification:** No later than 30 days after the initial generation of salt cake, the project owner shall notify the CPM of the test results and the planned disposal method.

## REFERENCES

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California Energy Commission, Sacramento, California (CEC) 2003a. Commission Determination that the Application for Certification is Complete. Submitted to Docket on December 17, 2003.

CH2MHill, Sacramento, California (CH2MHILL) 2004a. Applicant's Responses to CEC Staff Data Requests 1-71. Submitted to the Docket on February 6, 2004.

CH2MHill, Sacramento, California (CH2MHill) 2004e. Applicant's Responses to CEC Data Requests 70-71. Submitted to Docket on March 1 2004.

Gillette 2004a. Email March 17, 2004 from Maria Gillette, Department Toxic Substances Control to Ellen Townsend-Hough, California Energy Commission.

Gillette 2004b. Phone conversation March 30, 2004 from Maria Gillette, Department Toxic Substances Control to Ellen Townsend-Hough, California Energy Commission.

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# **WORKER SAFETY AND FIRE PROTECTION**

Geoff Lesh, P.E. and Rick Tyler

## **INTRODUCTION**

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Worker safety and fire protection is enforced by laws, ordinances, regulations, and standards (LORS), and implemented at the federal, state, and local levels. Worker safety is of utmost priority at the project location and is documented through worker safety practices and training. Industrial workers at the facility operate process equipment and handle hazardous materials daily and may face hazards that can result in accidents and serious injury. Protection measures are employed to either eliminate these hazards or minimize the risk through special training, protective equipment, or procedural controls.

The purpose of the Worker Safety and Fire Protection analysis is to assess the worker safety and fire protection measures proposed by the Roseville Energy Park (REP) and to determine whether the applicant has proposed adequate measures to:

- comply with applicable safety LORS;
- protect the workers during construction and operation of the facility;
- protect against fire; and
- provide adequate emergency response procedures.

## **LAWS, ORDINANCES, REGULATIONS AND STANDARDS**

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### **FEDERAL**

In December 1970, Congress enacted Public Law 91-596, the Federal Occupational Safety and Health Act (OSH Act) of 1970. This Act mandates safety requirements in the workplace and is found in Title 29 of the United States Code, § 651 (29 U.S.C. §§ 651 through 678). Implementing regulations are codified at Title 29 of the Code of Federal Regulations, under General Industry Standards §§ 1910.1 - 1910.1500 and clearly define the procedures for conducting inspections to implement and enforce safety and health procedures to protect workers, particularly in the industrial sector. Most of the general industry safety and health standards now in force under this OSH Act represent a compilation of materials from existing federal standards and national consensus standards. These include standards from the voluntary membership organizations of the American National Standards Institute (ANSI) and the National Fire Protection Association (NFPA) which publishes the National Fire Codes.

The purpose of the Occupational Safety and Health Act is to “assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources,” (29 U.S.C. § 651). The Federal Department of Labor promulgates and enforces safety and health standards that are applicable to all businesses affecting interstate commerce. The Department of Labor established the

Occupational Safety and Health Administration (OSHA) in 1971 to discharge the responsibilities assigned by the OSH Act.

Applicable federal requirements include:

- 29 U.S.C. § 651 et seq. (Occupational Safety and Health Act of 1970);
- 29 C.F.R. §§ 1910.1 - 1910.1500 (Occupational Safety and Health Administration Safety and Health Regulations);
- 29 C.F.R. §§ 1952.170 – 1952.175 (federal approval of California's plan for enforcement of its own Safety and Health requirements, in lieu of most of the federal requirements found in 29 C.F.R. §§ 1910.1 – 1910.1500).

## STATE

California passed the Occupational Safety and Health Act of 1973 ("Cal/OSHA") as published in the California Labor Code section 6300. Regulations promulgated as a result of the Act are codified at Title 8 of the California Code of Regulations, beginning with sections 337 through 560 and continuing with sections 1514 through 8568. The California Labor Code requires that the Cal/OSHA Standards Board adopt standards at least as effective as the federal standards (Labor Code § 142.3(a)) and thus all Cal/OSHA health and safety standards meet or exceed the federal requirements. California obtained federal approval of its State health and safety regulations, in lieu of the federal requirements published at Title 29 Code of Federal Regulations, sections 1910.1 through 1910.1500. The U.S. Secretary of Labor, however, continually oversees California's program and will enforce any federal standard for which the State has not adopted a Cal/OSHA counterpart.

The State of California Department of Industrial Relations is charged with responsibility for administering the Cal/OSHA plan. The Department of Industrial Relations is further split into six divisions to oversee, among other activities: industrial accidents, occupational safety and health, labor standards enforcement, statistics and research, and the State Compensation Insurance Fund (workers compensation).

Employers are responsible for informing their employees about workplace hazards, potential exposure, and the work environment (Labor Code §6408). Cal/OSHA's tool for ensuring that workers and the public are informed is the Hazard Communication standard first adopted in 1981 (Cal. Code Regs., tit. 8, § 5194). This regulation was promulgated in response to California's Hazardous Substances Information and Training Act of 1980. It was later revised to mirror the federal Hazard Communication Standard (29 C.F.R. §1910.1200) which established, on the federal level, an employee's "right to know" about chemical hazards in the workplace, but added the provision of applicability to public sector employers. A major component of this regulation is the required provision of Material Safety Data Sheets (MSDSs) to workers. MSDSs provide information on the identity, toxicity, and precautions to take when using or handling hazardous materials in the workplace.

Finally, Title 8, California Code of Regulations, section 3203 requires that employers establish and maintain a written Injury and Illness Prevent Program to identify workplace

hazards and communicate them to its employees through a formal employee-training program.

Applicable State requirements include:

- Title 8, California Code of Regulations, section 330 et seq. Cal/OSHA regulations;
- Title 24, California Code of Regulations, section 3 et seq. - incorporates the current addition of the Uniform Building Code;
- Health and Safety Code, section 25500 et seq. - Risk Management Plan requirements for threshold quantity of listed acutely hazardous materials at the facility;
- Health and Safety Code, sections 25500 - 25541 - Hazardous Material Business Plan detailing emergency response plans for hazardous materials emergency at the facility.

## **LOCAL**

The California Building Standards Code published at Title 24 of the California Code of Regulations, section 3 et seq. is comprised of eleven parts containing the building design and construction requirements relating to fire and life safety and structural safety. The Building Standards Code includes the electrical, mechanical, energy, and fire codes applicable to the project. Local planning/building & safety departments enforce the California Uniform Building Code.

National Fire Protection Association (NFPA) standards are published in the California Fire Code. The fire code contains general provisions for fire safety, including but not restricted to: 1) required road and building access; 2) water supplies; 3) installation of fire protection and life safety systems; 4) fire-resistive construction; 5) general fire safety precautions; 6) storage of combustible materials; 7) exits and emergency escapes; and 8) fire alarm systems. The California Fire Code reflects the body of regulations published at Part 9 of Title 24 pertaining to the California Fire Code.

Similarly, the Uniform Fire Code (UFC) Standards, a companion publication to the California Fire Code, contains standards of the American Society for Testing and Materials and the NFPA. It is the United States' premier model fire code. It is updated annually as a supplement and published every third year by the International Fire Code Institute to include all approved code changes in a new edition. The City of Roseville Fire Department is the administering agency for the 2000 Uniform Fire Code (Hendrickson 2002).

Applicable local (or locally enforced) requirements include:

- 2001 Edition of California Fire Code and all applicable NFPA standards (Cal. Code Regs., tit. 24, Part 9);
- California Building Code Title 24, California Code of Regulations (Cal. Code Regs., tit. 24, § 3 et seq.).
- Uniform Fire Code, 2000

## **SETTING**

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The proposed REP site is located approximately 5 miles northwest of downtown Roseville, and about 18 miles northeast of the City of Sacramento. The terrain elevation is approximately 95 feet above mean sea level. The overall terrain in the vicinity slopes downward in a westward direction toward the Sacramento Valley. At present, the area surrounding the site is generally undeveloped with some agricultural uses. See Project Description in this Preliminary Staff Assessment for more details.

The REP project involves construction and operation of a natural gas fired combined cycle facility with ancillary facilities including pipelines.

Fire support services to the site would be under the jurisdiction of the City of Roseville Fire Department. The closest fire station is Fire Station #5, located at 1567 Pleasant Grove Boulevard in Roseville, which is approximately 3.8 miles away (Roseville 2003a). The response time to the project site is estimated to be 8 to 10 minutes. Backup fire support, if needed, would come from Fire Station #2, located at 1398 Junction Boulevard in Roseville, with a similar response time. (Roseville 2003a Section 8.16.2.2, Ippolito).

The City of Roseville Hazardous Materials Team is assigned as the off-site hazardous materials first responder for the REP. Hazmat response would come from the fire station located at 401 Oak Street, Roseville, approximately 7 miles away. Their response time is estimated to be 15 minutes (Anderson).

## **IMPACTS**

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### **WORKER SAFETY**

Industrial environments are potentially dangerous during construction and operation of facilities. Workers at the proposed project would be exposed to loud noises, moving equipment, trenches, and confined space entry and egress problems. The workers may experience falls, trips, burns, lacerations, and numerous other injuries. They have the potential to be exposed to falling equipment or structures, chemical spills, hazardous waste, fires, explosions, and electrical sparks and electrocution. It is important for the Roseville Energy Park to have well-defined policies and procedures, training, and hazard recognition and control at their facility to minimize such hazards and protect workers. If the facility complies with all LORS, workers would be adequately protected from health and safety hazards.

### **FIRE HAZARDS**

During construction and operation of the proposed Roseville Energy Park, there is the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, natural gas or flammable liquids, explosions, and over-heated equipment, may cause small fires. Major structural fires may develop from uncontrolled fires or be caused by large explosions of natural gas or other flammable gasses or liquids. Compliance with all LORS would be adequate to assure protection from all fire hazards. The City of Roseville Fire Department has stated that it is adequately equipped and



staffed to respond to an on-site fire within 10 minutes or less (Ippolito), and the City of Roseville Fire Department has stated that they are prepared to deal with any conceivable hazardous materials spill (Anderson).

## **APPLICANT'S PROPOSED MITIGATION**

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### **WORKER SAFETY**

A Safety and Health Program would be prepared by the applicant to minimize worker hazards during construction and operation. Staff uses the phrase "Safety and Health Program" to refer to the measures that would be taken to ensure compliance with the applicable LORS during the construction and operational phases of the project.

#### **Construction Safety and Health Program**

The Roseville Energy Park encompasses construction and operation of a natural gas fired facility with ancillary facilities such as transmission lines and pipelines. Workers would be exposed to hazards typical of construction and operation of a gas-fired combined cycle facility.

Construction Safety Orders are published at Title 8, California Code of Regulations, section 1502 et seq. These requirements are promulgated by Cal/OSHA and are applicable to the construction phases of the project. The Construction Safety and Health Program would include the following:

- Construction Injury and Illness Prevention Program (Cal. Code Regs., tit. 8, § 1509);
- Construction Fire Protection and Prevention Plan (Cal. Code Regs., tit. 8, § 1920); and
- Personal Protective Equipment Program (Cal. Code Regs., tit. 8, §§ 1514 - 1522).

Additional programs under General Industry Safety Orders (Cal. Code Regs., tit. 8, §§ 3200 - 6184), Electrical Safety Orders (Cal. Code Regs., tit. 8, §§2299 - 2974) and Unfired Pressure Vessel Safety Orders (Cal. Code Regs., tit. 8, §§ 450 - 544) would include:

- Electrical Safety Program;
- Unfired Pressure Vessel Safety Orders;
- Equipment Safety Program;
- Forklift Operation Program;
- Excavation/Trenching Program;
- Fall Prevention Program;
- Scaffolding/Ladder Safety Program;
- Articulating Boom Platforms Program;
- Crane and Material Handling Program;

- Housekeeping and Material Handling and Storage Program;
- Hot Work Safety Program;
- Respiratory Protection Program;
- Employee Exposure Monitoring Program;
- Confined Space Entry Program;
- Hand and Portable Power Tool Safety Program;
- Hearing Conservation Program;
- Back Injury Prevention Program;
- Hazard Communication Program;
- Air Monitoring Program;
- Heat and Cold Stress Monitoring and Control Program; and
- Pressure Vessel and Pipeline Safety Program.

The AFC includes adequate outlines of each of the above programs. Prior to construction of the Roseville Energy Park, detailed programs and plans would be provided pursuant to the condition of certification **WORKER SAFETY-1**.

### **Operations and Maintenance Safety and Health Program**

Upon completion of construction and prior to operations at the Roseville Energy Park, the Operations and Maintenance Safety and Health Program would be prepared. This operational safety program would include the following programs and plans:

- Injury and Illness Prevention Program (Cal. Code Regs., tit. 8, § 3203);
- Emergency Action Plan (Cal. Code Regs., tit. 8, § 3220);
- Hazardous Materials Management Program;
- Operations and Maintenance Safety Program;
- Fire Protection and Prevention Program (Cal. Code Regs., tit. 8, § 3221); and
- Personal Protective Equipment Program (Cal. Code Regs., tit. 8, §§ 3401-3411).

In addition, the requirements under General Industry Safety Orders (Cal. Code Regs., tit. 8, §§ 3200 - 6184), Electrical Safety Orders (Cal. Code Regs., tit. 8, §§ 2299 - 2974) and Unfired Pressure Vessel Safety Orders (Cal. Code Regs., tit. 8, §§ 450 - 544) would be applicable to the project. Written safety programs, which the applicant would develop, for the Roseville Energy Park project would ensure compliance with the above-mentioned requirements.

The AFC includes an adequate outline of the Emergency Action Plan (Roseville 2003a, Pages 8.7-12 and 8.7-16). Prior to operation of the Roseville Energy Park project, all detailed programs and plans would be provided pursuant to condition of certification **WORKER SAFETY-2**.

## **Safety and Health Program Elements**

The applicant provided the proposed outlines for both a Construction Safety and Health Program and an Operation Safety and Health Program (Roseville 2003a, Section 8.7.4.3). The measures in these plans are derived from applicable sections of state and federal law. The major items required in both construction and operation Safety and Health programs are as follows:

### **Injury and Illness Prevention Program (IIPP)**

The applicant would submit an expanded Construction and Operations Illness and Injury Prevention Program to Cal/OSHA for review and comment 30 days prior to construction and operation of the project.

The IIPP would include the following components as presented in the AFC:

- Identity of person(s) with authority and responsibility for implementing the program;
- System ensuring employees comply with safe and healthy work practices;
- System facilitating employer-employee communications;
- Procedures identifying and evaluating workplace hazards, including inspections to identify hazards and unsafe conditions;
- Methods for correcting unhealthy/unsafe conditions in a timely manner;
- Methods of documenting inspections and training and for maintaining records; and
- A training program for introducing the program; for new, transferred, or promoted employees; for new processes and equipment; for supervisors; for contractors.

### **Emergency Action Plan**

California regulations require an Emergency Action Plan (Cal. Code Regs., tit. 8, § 3220). The AFC contains a satisfactory outline for an emergency action plan (Roseville 2003a, Pages 8.7-12 and 8.7-16).

The outline lists the following features:

- Purpose and Scope of Emergency Action Plan;
- Personnel Responsibilities during Emergencies;
- Specific Response Procedures;
- Evacuation Plan;
- Emergency Equipment Locations;
- Fire Extinguisher Locations;
- Site Security;
- Accident Reporting and Investigation;
- Lockout/Tagout;
- Hazard Communication;

- Spill Containment and Reporting;
- First Aid and Medical Response;
- Respiratory Protection;
- Personal Protective Equipment;
- Sanitation; and
- Work Site Inspections.

### **Fire Prevention Plan**

California Code of Regulations requires an Operations Fire Prevention Plan (Cal. Code Regs., tit. 8, § 3221). The AFC describes a proposed fire prevention plan which is acceptable to Staff (Roseville 2003a, Page 8.16 -11). The plan would include the following topics:

- Responsibilities;
- Procedures for fire control;
- Fixed and Portable fire-fighting equipment;
- Housekeeping;
- Employee alarm/communication practices;
- Servicing and refueling areas;
- Training; and
- Flammable and combustible liquid storage.

Staff proposes that the applicant submit a final Fire Protection and Prevention Plan to the California Energy Commission Compliance Project Manager (CPM) and the City of Roseville Fire Department for review and approval to satisfy proposed conditions of certification **WORKER SAFETY-1** and **-2**.

### **Personal Protective Equipment Program**

California regulations require Personal Protective Equipment (PPE) and first aid supplies whenever hazards are encountered which, due to process, environment, chemicals or mechanical irritants can cause injury or impair bodily function as a result of absorption, inhalation or physical contact (Cal. Code Regs., tit. 8, §§ 3380-3400). The Roseville Energy Park project operational environment would require a PPE program.

Information provided in the AFC indicates that all employees required to use PPE would be checked for proper fit and to see if they are medically capable of wearing the equipment. All safety equipment would meet NIOSH or ANSI standards and would carry markings, numbers, or certificates of approval. Respirators would meet NIOSH and California Department of Health and Human Services Standards.

Each employee would be provided with the following information pertaining to the protective clothing and equipment:

- proper care, maintenance, and storage;
- when the protective clothing and equipment should be used;
- benefits and limitations; and
- when and how the protective clothing and equipment are to be replaced.

A PPE program ensures that employers comply with the applicable requirements for PPE and provide employees with the information and training necessary to implement the program.

### **Operations and Maintenance Written Safety Program**

In addition to the specific plans listed above, there are additional LORS applicable to the project, which are called "safe work practices". Both the Construction and the Operations Safety Programs would address safe work practices under a variety of programs. The components of these programs include the following:

- Fall Protection Program;
- Hot Work Safety Program;
- Confined Space Entry;
- Hearing Conservation Program;
- Hazard Communication Program;
- Process Safety Management (PSM) Program; and
- Contractor Safety Program.

### **Operations and Maintenance Safety Training Programs**

Employees would be trained in the safe work practices described in the above-referenced safety programs.

## **FIRE PROTECTION**

Staff reviewed the information provided in the AFC regarding available fire protection services and equipment (Roseville 2003a, Section 8.16) to determine if the project would adequately protect workers and if it would affect the fire protection services in the area. The project would rely on both on-site fire protection systems and local fire protection services. The onsite fire protection system provides the first line of defense for small fires. In the event of a major fire, fire support services including trained firefighters and equipment for a sustained response would be required from the City of Roseville Fire Department.

During construction, an interim fire protection system would be in place. The permanent facility fire protection system would be placed in service as early as possible during the construction phase.

The information in the AFC indicates that the project intends to meet the minimum fire protection and suppression requirements. Staff agrees that the project will indeed meet all requirements. Elements include both fixed and portable fire extinguishing systems.

Water for firefighting will be stored in an on-site tank that will contain recycled water supplied by the neighboring waste water treatment plant.

Fixed fire suppression systems will be installed at determined fire risk areas. A carbon dioxide (CO<sub>2</sub>) fire protection system would be provided for the combustion turbine generator (CTG) enclosure and accessory equipment (Roseville 2003a, Section 8.16.2). This system will have automatic fire detection sensors. Deluge type spray systems which provide fire protection for the steam turbine lube oil skid and combustion turbine lube oil skids.

Fire hydrants and hose stations would supplement the plant fire protection system using water from the plant underground firewater system loop. Fire hydrants with hose houses would be placed in accordance with NFPA 10 and local fire codes. Electric motor-driven fire pumps will provide water under pressure for the plant fire water loop. A diesel engine-driven fire pump will provide backup to the motor-driven pumps in the event of a power failure. Sprinkler systems will also be installed in the administration building and the fire pump enclosure, as required by NFPA and local code requirements.

The applicant will be required to provide the final Fire Protection and Prevention Program to Staff and to the City of Roseville Fire Department, prior to construction and operation of the project, to confirm the adequacy of the proposed fire protection measures.

## **FACILITY CLOSURE**

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The project owner/operator is responsible for maintaining an operational fire protection system during closure activities. The project must also stay in compliance with all applicable health and safety LORS during that time. A facility closure plan will be developed prior to closure to incorporate these requirements.

## **CUMULATIVE IMPACTS**

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Staff reviewed the potential for the construction and operation of the Roseville Energy Park project, combined with existing industrial facilities, to result in impacts on the fire and emergency service capabilities of the City of Roseville Fire Department and found that cumulative impacts were insignificant. There are few industrial facilities in this agricultural area, Assistant Fire Marshal Tim Ippolito confirmed that the City of Roseville Fire Department is adequately staffed and equipped to control whatever fire could occur at an industrial facility of this type, and the department's response time will be adequate (Ippolito). Staff also finds that the fire-fighting response time is no greater than for other California rural power plants previously certified by the CEC.

## CONCLUSION AND RECOMMENDATIONS

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If the applicant provides a Project Construction Safety and Health Program and a Project Operations Safety and Health Program as required by Conditions of Certification **WORKER SAFETY-1** and **-2**, Staff believes that the project would incorporate sufficient measures to ensure adequate levels of industrial safety, and comply with applicable LORS. The Safety and Health Programs apply to all project-related construction and operations, including the new gas pipeline and compressor stations. Staff also concludes that the proposed project, including the new natural gas line and compressor stations, would not have significant impacts on local fire protection services.

If the Energy Commission certifies the project, Staff recommends the adoption of the following proposed Conditions of Certification. The proposed Conditions of Certification provide assurance that the Construction Safety and Health Program and the Operations Safety and Health Program proposed by the applicant would be reviewed by the appropriate agencies before implementation. The conditions also require verification that the proposed plans adequately assure worker safety and fire protection and comply with applicable LORS. Condition of Certification **WORKER SAFETY-3** assures that the worker safety and health plans are properly implemented and monitored during the construction and commissioning phases of the project.

## PROPOSED CONDITIONS OF CERTIFICATION

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**WORKER SAFETY-1** The project owner shall submit to the Compliance Project Manager (CPM) a copy of the Project Construction Safety and Health Program containing a:

- Construction Safety Program;
- Construction Personal Protective Equipment Program;
- Construction Exposure Monitoring Program;
- Construction Emergency Action Plan; and
- Construction Fire Protection and Prevention Plan.

The Safety Program, the Personal Protective Equipment Program, and the Exposure Monitoring Program shall be submitted to the CPM for review and comment concerning compliance of the program with all applicable Safety Orders. The Construction Fire Protection and Prevention Plan and Emergency Action Plan shall be submitted to the City of Roseville Fire Department for review and comment prior to submittal to the CPM.

**Verification:** At least 30 days prior to the start of construction, the project owner shall submit to the CPM for review and approval a copy of the Project Construction Safety and Health Program. The project owner shall provide a letter from the City of Roseville Fire Department stating that they have reviewed and commented on the Construction Fire Protection and Prevention Plan and Emergency Action Plan.

**WORKER SAFETY-2** The project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety and Health Program containing the following:

- Operation Injury and Illness Prevention Plan;
- Emergency Action Plan;
- Hazardous Materials Management Program;
- Operations and Maintenance Safety Program;
- Fire Protection and Prevention Program (Cal. Code Regs., tit. 8, § 3221); and;
- Personal Protective Equipment Program (Cal. Code Regs., tit. 8, §§ 3401-3411).

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the Cal/OSHA Consultation Service, for review and comment concerning compliance of the program with all applicable Safety Orders. The Operation Fire Protection Plan and the Emergency Action Plan shall also be submitted to the City of Roseville Fire Department for review and acceptance.

**Verification:** At least 30 days prior to the start of operation, the project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety & Health Program.

**WORKER SAFETY-3** The project owner shall ensure that a CPM approved Safety Monitor(s) conducts an on-site safety inspection at least once a week during construction of permanent structures, and commissioning, of the power plant unless a lesser number of inspections are approved by the CPM. The CPM may also require a similar inspection and report concerning linear facilities.

The Safety Monitor shall keep the Chief Building Official (CBO) fully informed regarding safety related matters and coordinate with the CBO concerning on-site safety inspections, and a final safety inspection prior to issuance of the Certificate of Occupancy by the CBO. The Safety Monitor will be retained until cessation of construction and commissioning activities, and issuance of the Certificate of Occupancy, unless otherwise approved by the CPM.

The Safety Monitor(s) shall also:

- Correct any construction or commissioning problems that could pose a future danger to life or health, consulting with the CBO as necessary.
- After consultation with the CBO, have the authority to temporarily stop construction or commissioning activities involving possible safety violations or unsafe conditions that may pose an immediate or future danger to life or health, until the problem is resolved to the satisfaction of the Safety Monitor and CBO.



- Consult with the CBO to determine when construction may resume unless the problem is corrected immediately, and to the satisfaction of the Safety Monitor and/or CBO.
- Inform the CPM within 24 hours of any temporary halt in construction or commissioning activities.
- Be available to inspect the site whenever necessary in addition to the minimum weekly basis during construction and commissioning as determined in consultation with the CBO and CPM.
- Develop a safety program for the project that complies with Cal/OSHA & federal regulations related to power plant projects.
- Ensure that all federal and Cal/OSHA requirements are practiced during the construction and installation of all permanent structures (including safety aspects of electrical installations).
- Ensure that all construction and commissioning workers and supervisors receive adequate safety training.
- Conduct safety training (including fall protection, confined spaces, respiratory protection, hazard communication, etc.), or ensure that the project owner, union hall, and/or contractors conduct adequate safety training.
- Maintain all Material Safety Data Sheets, storage of all hazardous materials and all other required documentation for Cal/OSHA.
- Complete all accident and incident investigations, emergency response reports for injuries and inform the CPM of incidents.
- Ensure that all the plans identified in Worker Safety 1 are implemented.

The Safety Monitor shall be qualified regarding the following:

- Safety issues related to equipment, pipelines, etc,
- LORS applicable to workplace safety and worker protection
- Workplace hazards typically associated with power production
- Lock out tag out and confined spaces control systems
- Site security practices and issues

**Verification:** The project owner shall submit the Safety Monitor(s) resume(s) to the CPM for approval at least 30 days prior to site mobilization. One or more individuals may hold this position.

The Safety Monitor shall submit in the Monthly Compliance Report a monthly safety inspection report to include:

Record of all employees trained for that month (all records shall be kept on site for the duration of the project);

Summary report of safety management actions that occurred during the month;

Report of any continuing or unresolved situations and incidents that may pose danger to life or health;

Report of accidents and injuries that occurred during the month.

## **REFERENCES**

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2001 California Fire Code. Published by the International Fire Code Institute comprised of the International Conference of Building Officials, the Western Fire Chiefs Association, and the California Building Standards Commission. Whittier, Ca.

Anderson, Steve. Life Safety/Hazmat Officer, City of Roseville Fire Department. Personal communication April 29, 2004.

Ippolito, Tim. Assistant Fire Marshal, City of Roseville Fire Department. Personal communication, April 30, 2004.

Roseville Electric, Roseville, California (Roseville) 2003a. Application for Certification Volumes I & II. Submitted to the Docket on October 30, 2003.

# FACILITY DESIGN

Kevin Robinson, Al McCuen and Steve Baker

## INTRODUCTION

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Facility Design encompasses the civil, structural, mechanical and electrical engineering design of the project. The purpose of the Facility Design analysis is to:

- verify that the laws, ordinances, regulations and standards (LORS) applicable to the engineering design and construction of the project have been identified;
- verify that the project and ancillary facilities have been described in sufficient detail, including proposed design criteria and analysis methods, to provide reasonable assurance that the project can be designed and constructed in accordance with all applicable engineering LORS, and in a manner that assures public health and safety;
- determine whether special design features should be considered during final design to deal with conditions unique to the site which could influence public health and safety; and
- describe the design review and construction inspection process and establish Conditions of Certification that will be used to monitor and ensure compliance with the engineering LORS and any special design requirements.

Subjects discussed in this analysis include:

- Identification of the engineering LORS applicable to facility design;
- Evaluation of the applicant's proposed design criteria, including the identification of those criteria that are essential to ensuring public health and safety;
- Proposed modifications and additions to the Application for Certification (AFC) that are necessary to comply with applicable engineering LORS; and
- Conditions of Certification proposed by staff to ensure that the project will be designed and constructed to assure public health and safety and comply with all applicable engineering LORS.

## SETTING

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Roseville Electric (RE) proposes to construct and operate a nominally rated 120-125 megawatt (MW) combined cycle power plant known as the Roseville Energy Park (REP). The project will be located in the City of Roseville, Placer County. The site will occupy approximately 12 acres of a 40 acre parcel within the City of Roseville and will lie in seismic zone 3. For more information on the site and related project description, please see the **Project Description** section of this document. References to "the City" and "the County" designate the City of Roseville and Placer County, respectively. Additional engineering design details are contained in the Application for Certification (AFC), in Appendices 10-A through 10-D (RE 2003a).

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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Lists of LORS applicable to each engineering discipline (civil, structural, mechanical and electrical) are described in the AFC (RE 2003a, Appendices 10-A through 10-D). Some of these LORS include the California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations), American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), American Society for Testing and Materials (ASTM) and American Welding Society (AWS).

## ANALYSIS

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The basis of this analysis is the applicant's analysis, proposed construction methods, and the list of engineering LORS and design criteria set forth in the AFC.

## SITE PREPARATION AND DEVELOPMENT

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage, and site access. Staff has assessed the criteria for designing and constructing linear support facilities such as a natural gas pipeline and electric transmission line. The applicant proposes to use accepted industry standards (see AFC Appendices 10-A through 10-D for a representative list of applicable industry standards), design practices and construction methods in preparing and developing the site. Staff concludes that the project, including its linear facilities, would most likely comply with all applicable site preparation LORS, and proposes Conditions of Certification (see below and the **Geology and Paleontology** section of this document) to ensure compliance.

## MAJOR STRUCTURES, SYSTEMS AND EQUIPMENT

Major structures, systems and equipment are defined as those structures and associated components or equipment that are necessary for power production and are costly to repair or replace, that require a long lead time to repair or replace, or that are used for the storage, containment, or handling of hazardous or toxic materials. Major structures and equipment will be identified through compliance with proposed Condition of Certification **GEN-2** (below).

The AFC contains lists of the civil, structural, mechanical and electrical design criteria that demonstrate the likelihood of compliance with applicable engineering LORS, and that staff believes are essential to ensuring that the project is designed in a manner that protects public health and safety.

The project shall be designed and constructed to the 2001 edition of the California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations), which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and other applicable codes and standards in effect at the time design and construction of the project actually commences. In the event the initial designs are submitted to the Chief Building Official (CBO) for review and approval when the successor to the 2001

CBSC is in effect, the 2001 CBSC provisions, identified herein, shall be replaced with the applicable successor provisions.

Certain structures in a power plant may be required, under the CBC, to undergo dynamic lateral force (structural) analysis; others may be designed using the simpler static analysis procedure. In order to ensure that structures are analyzed using the appropriate lateral force procedure, staff has included Condition of Certification **STRUC-1** (below), which in part, requires review and approval by the CBO of the project owner's proposed lateral force procedures prior to the start of construction.

## **PROJECT QUALITY PROCEDURES**

The AFC (RE 2003a, § 2.2.18.5) describes a project Quality Program that will be used on the project to maximize confidence that systems and components will be designed, fabricated, stored, transported, installed and tested in accordance with the technical codes and standards appropriate for a power plant. Compliance with design requirements will be verified through an appropriate program of inspections and audits. Employment of this quality assurance/quality control (QA/QC) program would ensure that the project is actually designed, procured, fabricated, and installed as contemplated in this analysis.

## **COMPLIANCE MONITORING**

Under Section 104.2 of the CBC, the building official is authorized and directed to enforce all the provisions of the CBC. For all energy facilities certified by the Energy Commission, the Energy Commission is the building official and has the responsibility to enforce the code. In addition, the Energy Commission has the power to render interpretations of the CBC and to adopt and enforce rules and supplemental regulations to clarify the application of the CBC's provisions.

The Energy Commission's design review and construction inspection process is developed to conform to CBC requirements and to ensure that all facility design Conditions of Certification are met. As provided by Section 104.2.2 of the CBC, the Energy Commission appoints experts to carry out the design review and construction inspections and act as delegate CBO on behalf of the Energy Commission. These delegates typically include the local building official and/or independent consultants hired to cover technical expertise not provided by the local official. The applicant, through permit fees as provided by CBC Sections 107.2 and 107.3, pays the costs of the reviews and inspections. While building permits in addition to the Energy Commission certification are not required for this project, in lieu permit fees are paid by the applicant consistent with CBC Section 107, to cover the costs of reviews and inspections.

Engineering and compliance staff will invite the local building authority, either the City or the County, or a third party engineering consultant, to act as CBO for the project. When an entity has been identified to perform the duties of CBO, Energy Commission staff will complete a Memorandum of Understanding (MOU) with that entity that outlines its roles and responsibilities and those of its subcontractors and delegates.

Staff has developed proposed Conditions of Certification to ensure public health and safety and compliance with engineering design LORS. Some of these conditions address the roles, responsibilities and qualifications of the applicant's engineers responsible for the design and construction of the project (proposed Conditions of Certification **GEN-1** through **GEN-8**). Engineers responsible for the design of the civil, structural, mechanical and electrical portions of the project are required to be registered in California, and to sign and stamp each submittal of design plans, calculations and specifications submitted to the CBO. These conditions require that no element of construction subject to CBO review and approval shall proceed without prior approval from the CBO. They also require that qualified special inspectors be assigned to perform or oversee special inspections required by the applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility in scheduling construction activities, these conditions are written to require that no element of construction of permanent facilities subject to CBO review and approval, which would be difficult to reverse or correct, may proceed without prior approval of plans by the CBO. Those elements of construction that are not difficult to reverse are allowed to proceed without approval of the plans. The applicant shall bear the responsibility to fully modify those elements of construction to comply with all design changes that result from the CBO's subsequent plan review and approval process.

## **FACILITY CLOSURE**

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The removal of a facility from service, or decommissioning, as a result of the project reaching the end of its useful life, may range from "mothballing" to removal of all equipment and appurtenant facilities and restoration of the site. Future conditions that may affect the decommissioning decision are largely unknown at this time.

In order to assure that decommissioning of the facility will be completed in a manner that is environmentally sound, safe and will protect public health and safety, the applicant shall submit a decommissioning plan to the Energy Commission for review and approval prior to the commencement of decommissioning. The plan shall include a discussion of:

- proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project;
- all applicable LORS, local/regional plans and the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;
- the activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and
- decommissioning alternatives, other than complete site restoration.

The above requirements should serve as adequate protection, even in the unlikely event of project abandonment. Staff has proposed general conditions (see **General Conditions**) to ensure that these measures are included in the Facility Closure plan.

## CONCLUSIONS AND RECOMMENDATIONS

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### CONCLUSIONS

1. The laws, ordinances, regulations and standards (LORS) identified in the AFC and supporting documents are those applicable to the project.
2. Staff has evaluated the proposed engineering LORS, design criteria and design methods in the record, and concludes that the design, construction and eventual closure of the project are likely to comply with applicable engineering LORS.
3. The Conditions of Certification proposed will ensure that the proposed facilities are designed and constructed in accordance with applicable engineering LORS. This will occur through the use of design review, plan checking and field inspections, which are to be performed by the CBO or other Energy Commission delegate. Staff will audit the CBO to ensure satisfactory performance.
4. Whereas future conditions that may affect decommissioning are largely unknown at this time, it can reasonably be concluded that if the project owner submits a decommissioning plan as required in the **General Conditions** portion of this document prior to the commencement of decommissioning, the decommissioning procedure is likely to occur in compliance with all applicable engineering LORS.

### RECOMMENDATIONS

Energy Commission staff recommends that:

1. The Conditions of Certification proposed herein be adopted to ensure that the project is designed and constructed to assure public health and safety, and to ensure compliance with all applicable engineering LORS;
2. The project be designed and built to the 2001 CBSC (or successor standard, if such is in effect when the initial project engineering designs are submitted for review); and
3. The CBO shall review the final designs, conduct plan checking and perform field inspections during construction. Energy Commission staff shall audit and monitor the CBO to ensure satisfactory performance.

### CONDITIONS OF CERTIFICATION

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- GEN-1** The project owner shall design, construct and inspect the project in accordance with the 2001 California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations), which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and all other applicable engineering LORS in effect at the time initial design plans are submitted to the CBO for review and approval. (The CBSC in effect is that edition that has been adopted by the California Building Standards Commission and published at least 180 days previously.) The project owner shall insure that all the provisions of the above applicable codes be enforced

during any construction, addition, alteration, moving, demolition, repair, or maintenance of the completed facility [2001 CBC, Section 101.3, Scope]. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

In the event that the initial engineering designs are submitted to the CBO when a successor to the 2001 CBSC is in effect, the 2001 CBSC provisions identified herein shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

The project owner shall insure that all contracts with contractors, subcontractors and suppliers shall clearly specify that all work performed and materials supplied on this project comply with the codes listed above.

**Verification:** Within 30 days after receipt of the Certificate of Occupancy, the project owner shall submit to the Compliance Project Manager (CPM) a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation and inspection requirements of the applicable LORS and the Energy Commission's Decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy within 30 days of receipt from the CBO [2001 CBC, Section 109 – Certificate of Occupancy].

Once the Certificate of Occupancy has been issued, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed facility which may require CBO approval for the purpose of complying with the above stated codes. The CPM will then determine the necessity of CBO approval on the work to be performed.

**GEN-2** Prior to submittal of the initial engineering designs for CBO review, the project owner shall furnish to the CPM and to the CBO a schedule of facility design submittals, a Master Drawing List and a Master Specifications List. The schedule shall contain a list of proposed submittal packages of designs, calculations and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM when requested.

**Verification:** At least 60 days (or project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO and to the CPM the schedule, the Master Drawing List and the Master Specifications List of documents to be submitted to the CBO for review and approval. These documents shall be the pertinent design documents for the major structures and equipment listed in **Facility Design Table 1** below. Major structures and equipment shall be added to or deleted from the table only with CPM approval. The project owner shall provide schedule updates in the Monthly Compliance Report.



**Table 1: Major Structures and Equipment List**

<b>Equipment/System</b>	<b>Quantity (Plant)</b>
Combustion Turbine (CT) Foundation and Connections	2
Combustion Turbine Generator Foundation and Connections	2
Steam Turbine (ST) Foundation and Connections	1
Steam Turbine Generator Foundation and Connections	1
Steam Condenser and Auxiliaries Foundation and Connections	1
Heat Recovery Steam Generator (HRSG) Structure, Foundation and Connections	2
HRSG Feed Pumps Foundation and Connections	2
HRSG Stack Structure, Foundation and Connections	2
CT Main Transformer Foundation and Connections	2
ST Main Transformer Foundation and Connections	1
Auxiliary or Station Service Transformer Foundation and Connections	1
CT Air Inlet System Structure, Foundation and Connections	2
HRSG Transition Duct from CTG — Structure	2
Condensate Pumps Foundation and Connections	3
Circulating Water Pumps Foundation and Connections	2
Power Cycle Makeup and Storage Pumps Foundation and Connections	2
Cooling Tower Makeup Pumps Foundation and Connections	2
Demineralized Water Storage Tank and Pump Foundations and Connections	1
Condensate Storage and Transfer System Foundation and Connections	1
Condensate Water Tank Foundation and Connections	1
Closed Cycle Cooling Water Heat Exchanger Foundation and Connections	2
Auxiliary Cooling Water Pumps Foundation and Connections	2
Waste Water Collection System Foundation and Connections	1
Fuel gas Heater Foundation and Connections	1
Fire Protection System	1
Cooling Tower Structure, Foundation and Connections	1
Generator Breakers Foundation and Connections	3
Transformer Breakers Foundation and Connections	3
Natural Gas Metering Station Structure, Foundation and Connections	1
Natural Gas Compressor Skid Foundation and Connections	2
Ammonia Storage Facility Foundation and Connections	1
Closed Cycle Cooling Pumps Foundation and Connections	2
Demineralizer - RO System Foundation and Connections	2
Warehouse/Shop Structure, Foundation and Connections	1
Gas Compressor Building Structure, Foundation and Connections	1
Demineralized Water Treatment Structure, Foundation and Connections	1

Equipment/System	Quantity (Plant)
Cooling Tower Blowdown Storage Tank, Foundation and Connections	1
Cooling Tower Chemical Feed Structure, Foundation and Connections	1
Auxiliary Boiler Foundation and Connections	1
Ammonia Vaporizer System Foundation and Connections	1
Continuous Emissions Monitoring Systems Structure, Foundation and Connections	1
Sound Wall at Property Line	1
Potable Water Systems	1 Lot
Drainage Systems (including sanitary drain and waste)	1 Lot
High Pressure and Large Diameter Piping and Pipe Racks	1 Lot
HVAC and Refrigeration Systems	1 Lot
Temperature Control and Ventilation Systems (including water and sewer connections)	1 Lot
Building Energy Conservation Systems	1 Lot
Switchyard, Buses and Towers	1 Lot
Electrical Duct Banks	1 Lot

**GEN-3** The project owner shall make payments to the CBO for design review, plan check and construction inspection based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. These fees may be consistent with the fees listed in the 2001 CBC [Chapter 1, Section 107 and Table 1-A, Building Permit Fees; Appendix Chapter 33, Section 3310 and Table A-33-A, Grading Plan Review Fees; and Table A-33-B, Grading Permit Fees], adjusted for inflation and other appropriate adjustments; may be based on the value of the facilities reviewed; may be based on hourly rates; or may be as otherwise agreed by the project owner and the CBO.

**Verification:** The project owner shall make the required payments to the CBO in accordance with the agreement between the project owner and the CBO. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable fees have been paid.

**GEN-4** Prior to the start of rough grading, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a resident engineer (RE), to be in general responsible charge of the project [Building Standards Administrative Code (Cal. Code Regs., tit. 24, § 4-209, Designation of Responsibilities)]. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project, respectively. A project may be divided into parts, provided each part

is clearly defined as a distinct unit. Separate assignment of general responsible charge may be made for each designated part.

The RE shall:

1. Monitor construction progress of work requiring CBO design review and inspection to ensure compliance with LORS;
2. Ensure that construction of all the facilities subject to CBO design review and inspection conforms in every material respect to the applicable LORS, these Conditions of Certification, approved plans, and specifications;
3. Prepare documents to initiate changes in the approved drawings and specifications when directed by the project owner or as required by conditions on the project;
4. Be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) of stamped drawings, plans, specifications and any other required documents;
5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and
6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests as not conforming to the approved plans and specifications.

The RE shall have the authority to halt construction and to require changes or remedial work, if the work does not conform to applicable requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

**Verification:** At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the resume and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) are subsequently reassigned or replaced, the project owner has five days in which to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

**GEN-5** Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: A) a civil engineer; B) a soils engineer, or a geotechnical engineer or a civil

engineer experienced and knowledgeable in the practice of soils engineering; and C) an engineering geologist. Prior to the start of construction, the project owner shall assign at least one of each of the following California registered engineers to the project: D) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; E) a mechanical engineer; and F) an electrical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730, 6731 and 6736 requires state registration to practice as a civil engineer or structural engineer in California.] All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all responsible engineers assigned to the project [2001 CBC, Section 104.2, Powers and Duties of Building Official].

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A. The civil engineer shall:

1. Review the Foundation Investigations Report, Geotechnical Report or Soils Report prepared by the soils engineer, the geotechnical engineer, or by a civil engineer experienced and knowledgeable in the practice of soils engineering;
2. Design, or be responsible for design, stamp, and sign all plans, calculations and specifications for proposed site work, civil works and related facilities requiring design review and inspection by the CBO. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads and sanitary sewer systems; and

3. Provide consultation to the RE during the construction phase of the project and recommend changes in the design of the civil works facilities and changes in the construction procedures.

B. The soils engineer, geotechnical engineer, or civil engineer experienced and knowledgeable in the practice of soils engineering, shall:

1. Review all the engineering geology reports;
2. Prepare the Foundation Investigations Report, Geotechnical Report or Soils Report containing field exploration reports, laboratory tests and engineering analysis detailing the nature and extent of the soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load [2001 CBC, Appendix Chapter 33, Section 3309.5, Soils Engineering Report; Section 3309.6, Engineering Geology Report; and Chapter 18, Section 1804, Foundation Investigations];
3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 2001 CBC, Appendix Chapter 33; Section 3317, Grading Inspections (depending on the site conditions, this may be the responsibility of either the soils engineer or engineering geologist or both); and
4. Recommend field changes to the civil engineer and RE.

This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations [2001 CBC, section 104.2.4, Stop orders].

C. The engineering geologist shall:

1. Review all the engineering geology reports and prepare final soils grading report; and
2. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 2001 CBC, Appendix Chapter 33; Section 3317, Grading Inspections (depending on the site conditions, this may be the responsibility of either the soils engineer or engineering geologist or both).

D. The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;
2. Provide consultation to the RE during design and construction of the project;

3. Monitor construction progress to ensure compliance with engineering LORS;
  4. Evaluate and recommend necessary changes in design; and
  5. Prepare and sign all major building plans, specifications and calculations.
- E. The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform with all of the mechanical engineering design requirements set forth in the Energy Commission's Decision.
- F. The electrical engineer shall:
1. Be responsible for the electrical design of the project; and
  2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

**Verification:** At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible civil engineer, soils (geotechnical) engineer and engineering geologist assigned to the project.

At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of construction, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible design engineer, mechanical engineer and electrical engineer assigned to the project.

The project owner shall notify the CPM of the CBO's approvals of the responsible engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

**GEN-6** Prior to the start of an activity requiring special inspection, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 2001 CBC, Chapter 17 [Section 1701, Special Inspections; Section 1701.5, Type of Work (requiring special inspection)]; and Section 106.3.5, Inspection and observation program. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;
2. Observe the work assigned for conformance with the approved design drawings and specifications;
3. Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action [2001 CBC, Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector]; and
4. Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans and specifications and the applicable provisions of the applicable edition of the CBC.

A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

**Verification:** At least 15 days (or project owner and CBO approved alternative timeframe) prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next Monthly Compliance Report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within five days of the approval.

**GEN-7** If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend the corrective action required [2001 CBC, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this Condition of Certification and, if appropriate, the applicable sections of the CBC and/or other LORS.

**Verification:** The project owner shall transmit a copy of the CBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next Monthly

Compliance Report. If any corrective action is disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval and the revised corrective action to obtain CBO's approval.

**GEN-8** The project owner shall obtain the CBO's final approval of all completed work that has undergone CBO design review and approval. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. The project owner shall notify the CPM after obtaining the CBO's final approval. The project owner shall retain one set of approved engineering plans, specifications and calculations (including all approved changes) at the project site or at another accessible location during the operating life of the project [2001 CBC, Section 106.4.2, Retention of Plans].

**Verification:** Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, in the next Monthly Compliance Report, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans. After storing final approved engineering plans, specifications and calculations as described above, the project owner shall submit to the CPM a letter stating that the above documents have been stored and indicate the storage location of such documents.

**CIVIL-1** The project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils Report, Geotechnical Report or Foundation Investigations Report required by the 2001 CBC [Appendix Chapter 33, Section 3309.5, Soils Engineering Report; Section 3309.6, Engineering Geology Report; and Chapter 18, Section 1804, Foundation Investigations].

**Verification:** At least 15 days (or project owner and CBO approved alternative timeframe) prior to the start of site grading the project owner shall submit the documents described above to the CBO for design review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

**CIVIL-2** The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible soils engineer, geotechnical engineer, or the civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area [2001 CBC, Section 104.2.4, Stop orders].



**Verification:** The project owner shall notify the CPM within 24 hours, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within 24 hours of the CBO's approval to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the CBO's approval.

**CIVIL-3** The project owner shall perform inspections in accordance with the 2001 CBC, Chapter 1, Section 108, Inspections; Chapter 17, Section 1701.6, Continuous and Periodic Special Inspection; and Appendix Chapter 33, Section 3317, Grading Inspection. All plant site-grading operations, for which a grading permit is required, shall be subject to inspection by the CBO.

If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO and the CPM [2001 CBC, Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. The project owner shall prepare a written report, with copies to the CBO and the CPM, detailing all discrepancies, non-compliance items, and the proposed corrective action.

**Verification:** Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a Non-Conformance Report (NCR), and the proposed corrective action for review and approval. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following Monthly Compliance Report.

**CIVIL-4** After completion of finished grading and erosion and sedimentation control and drainage work, the project owner shall obtain the CBO's approval of the final grading plans (including final changes) for the erosion and sedimentation control work. The civil engineer shall state that the work within his/her area of responsibility was done in accordance with the final approved plans [1998 CBC, Section 3318, Completion of Work].

**Verification:** Within 30 days (or project owner and CBO approved alternative timeframe) of the completion of the erosion and sediment control mitigation and drainage work, the project owner shall submit to the CBO, for review and approval, the final grading plans (including final changes) and the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes, with a copy of the transmittal letter to the CPM. The project owner shall submit a copy of the CBO's approval to the CPM in the next Monthly Compliance Report.

**STRUC-1** Prior to the start of any increment of construction of any major structure or component listed in **Facility Design Table 1** of Condition of Certification **GEN-2**, above, the project owner shall submit to the CBO for design review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed

lateral force procedures, designs, plans and drawings shall be those for the following items (from **Table 1**, above):

1. Major project structures;
2. Major foundations, equipment supports and anchorage;
3. Large field fabricated tanks;
4. Turbine/generator pedestal; and

Construction of any structure or component shall not commence until the CBO has approved the lateral force procedures to be employed in designing that structure or component.

The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;
2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (i.e., highest loads, or lowest allowable stresses shall govern). All plans, calculations and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations and specifications [2001 CBC, Section 108.4, Approval Required];
3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations and other required documents of the designated major structures prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation [2001 CBC, Section 106.4.2, Retention of plans; and Section 106.3.2, Submittal documents];
4. Ensure that the final plans, calculations and specifications clearly reflect the inclusion of approved criteria, assumptions and methods used to develop the design. The final designs, plans, calculations and specifications shall be signed and stamped by the responsible design engineer [2001 CBC, Section 106.3.4, Architect or Engineer of Record]; and

Submit to the CBO the responsible design engineer's signed statement that the final design plans conform to the applicable LORS [2001 CBC, Section 106.3.4, Architect or Engineer of Record].

**Verification:** At least 60 days (or project owner and CBO approved alternative timeframe) prior to the start of any increment of construction of any structure or component listed in **Facility Design Table 1** of Condition of Certification **GEN-2** above, the project owner shall submit to the CBO the above final design plans, specifications and calculations, with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM, in the next Monthly Compliance Report a copy of a statement from the CBO that the proposed structural plans, specifications and

calculations have been approved and are in compliance with the requirements set forth in the applicable engineering LORS.

**STRUC-2** The project owner shall submit to the CBO the required number of sets of the following documents related to work that has undergone CBO design review and approval:

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);
2. Concrete pour sign-off sheets;
3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);
4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and
5. Reports covering other structural activities requiring special inspections shall be in accordance with the 2001 CBC, Chapter 17, Section 1701, Special Inspections; Section 1701.5, Type of Work (requiring special inspection); Section 1702, Structural Observation and Section 1703, Nondestructive Testing.

**Verification:** If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit an NCR describing the nature of the discrepancies and the proposed corrective action to the CBO, with a copy of the transmittal letter to the CPM [2001 CBC, Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector]. The NCR shall reference the Condition(s) of Certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

**STRUC-3** The project owner shall submit to the CBO design changes to the final plans required by the 2001 CBC, Chapter 1, Section 106.3.2, Submittal documents and Section 106.3.3, Information on plans and specifications, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give to the CBO prior notice of the intended filing.

**Verification:** On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of

revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the Monthly Compliance Report, when the CBO has approved the revised plans.

**STRUC-4** Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in Chapter 3, Table 3-E of the 2001 CBC shall, at a minimum, be designed to comply with the requirements of that Chapter.

**Verification:** At least 30 days (or project owner and CBO approved alternate timeframe) prior to the start of installation of the tanks or vessels containing the above specified quantities of toxic or hazardous materials, the project owner shall submit to the CBO for design review and approval final design plans, specifications and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

**MECH-1** The project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations for each plant major piping and plumbing system listed in **Facility Design Table 1**, Condition of Certification **GEN-2**, above. Physical layout drawings and drawings not related to code compliance and life safety need not be submitted. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of said construction [2001 CBC, Section 106.3.2, Submittal Documents; Section 108.3, Inspection Requests; Section 108.4, Approval Required; 2001 California Plumbing Code, Section 103.5.4, Inspection Request; Section 301.1.1, Approval].

The responsible mechanical engineer shall stamp and sign all plans, drawings and calculations for the major piping and plumbing systems subject to the CBO design review and approval, and submit a signed statement to the CBO when the said proposed piping and plumbing systems have been designed, fabricated and installed in accordance with all of the applicable laws, ordinances, regulations and industry standards [Section 106.3.4, Architect or Engineer of Record], which may include, but not be limited to:

- American National Standards Institute (ANSI) B31.1 (Power Piping Code);
- ANSI B31.2 (Fuel Gas Piping Code);
- ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
- ANSI B31.8 (Gas Transmission and Distribution Piping Code);
- Title 24, California Code of Regulations, Part 5 (California Plumbing Code);

- Title 24, California Code of Regulations, Part 6 (California Energy Code, for building energy conservation systems and temperature control and ventilation systems);
- Title 24, California Code of Regulations, Part 2 (California Building Code); and
- Specific City/County code.

The CBO may deputize inspectors to carry out the functions of the code enforcement agency [2001 CBC, Section 104.2.2, Deputies].

**Verification:** At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of any increment of major piping or plumbing construction listed in **Facility Design Table 1**, Condition of Certification **GEN-2** above, the project owner shall submit to the CBO for design review and approval the final plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

The project owner shall transmit to the CPM, in the Monthly Compliance Report following completion of any inspection, a copy of the transmittal letter conveying the CBO's inspection approvals.

**MECH-2** For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by the applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of said installation [2001 CBC, Section 108.3, Inspection Requests].

The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and
2. Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

**Verification:** At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for design review and approval, the above listed documents, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall transmit to the CPM, in the Monthly Compliance Report following completion of any inspection, a copy of the transmittal letter conveying the CBO's and/or Cal-OSHA inspection approvals.

**MECH-3** The project owner shall submit to the CBO for design review and approval the design plans, specifications, calculations and quality control procedures for any heating, ventilating, air conditioning (HVAC) or refrigeration system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the CBC and other applicable codes. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, specifications and calculations shall include approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS [2001 CBC, Section 108.7, Other Inspections; Section 106.3.4, Architect or Engineer of Record].

**Verification:** At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

**ELEC-1** Prior to the start of any increment of electrical construction for electrical equipment and systems 480 volts and higher, listed below, with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations [CBC 2001, Section 106.3.2, Submittal documents]. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS [2001 CBC, Section 108.4, Approval Required, and Section 108.3, Inspection Requests]. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

A. Final plant design plans to include:

1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems; and
2. system grounding drawings.

B. Final plant calculations to establish:

1. short-circuit ratings of plant equipment;
  2. ampacity of feeder cables;
  3. voltage drop in feeder cables;
  4. system grounding requirements;
  5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;
  6. system grounding requirements; and
  7. lighting energy calculations.
- C. The following activities shall be reported to the CPM in the Monthly Compliance Report:
1. Receipt or delay of major electrical equipment;
  2. Testing or energization of major electrical equipment; and
  3. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission Decision.

**Verification:** At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for design review and approval the above listed documents. The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

## REFERENCES

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Roseville Electric, Roseville, California (ROSEVILLE) 2003a. Application for Certification Volumes I & II. Submitted to the Docket on October 30, 2003.

# **GEOLOGY, MINERAL RESOURCES, AND PALEONTOLOGY**

Patrick A. Pilling, Ph.D., P.E., G.E.

## **INTRODUCTION**

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In this section, Energy Commission staff discusses potential impacts of the proposed Roseville Energy Park (REP) project regarding geologic hazards, geologic (including mineralogic), and paleontologic resources. Staff's objective is to ensure that there will be no significant adverse impacts to significant geological and paleontological resources during project construction, operation and closure. A brief geological and paleontological overview of the project is provided. The section concludes with staff's proposed monitoring and mitigation measures with respect to geologic hazards and geologic, mineralogic, and paleontologic resources, with the inclusion of Conditions of Certification.

## **LAWS, ORDINANCES, REGULATIONS AND STANDARDS**

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The applicable Laws, Ordinances, Regulations and Standards (LORS) are listed in the Application for Certification (AFC), in Section 8.4.5, Table 8.4-3 and Section 8.8.5, Table 8.8-1 (ROSEVILLE, 2003a). The following is a brief description of the LORS for geologic hazards and resources, and mineralogic and paleontologic resources.

### **FEDERAL**

The proposed REP is not located on federal land. As such, there are no federal LORS for geological hazards and resources or grading for the REP plant site.

### **STATE AND LOCAL**

The project shall be designed and constructed to the 2001 edition of the California Building Standards Code (CBSC), in particular Part 2, the California Building Code (CBC). The CBC includes a series of standards that are used in project investigation, design and construction (including grading and erosion control).

The "Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources: Standard Procedures" (Society of Vertebrate Paleontology [SVP], 1995) is a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. The measures were adopted in October 1995 by the Society of Vertebrate Paleontology (SVP), a national organization of professional scientists.

## **SETTING**

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The proposed REP site is located in the lower Sacramento Valley, which is a subdivision of the Great Valley geomorphic province of California. The Great Valley is characterized by broad lowlands bounded by highly deformed rock units of the Coast Range to the west and the gently sloping western foothills of the Sierra Nevada mountains to the east. This valley is filled with a thick sequence of marine and non-marine sedimentary rocks of Jurassic to recent age. The plant site has been mapped



by the United States Geological Survey (Wagner et al., 1987) as being underlain by recent alluvium in the northeastern portion of the site and by the Riverbank Formation in the southwestern portion of the site. Recent alluvium is described as unconsolidated clay, silt, sand and gravel deposited by Holocene streams and rivers, and the Riverbank Formation is described as semi-consolidated, poorly-bedded layers of silt, clay, sand, and gravel deposited in a fluvial environment (URS, 2001a). Based on the results of exploration activities at the site (URS, 2001a), subsurface soils generally consist of medium dense to dense silty/clayey sand and stiff to hard sandy silt, silt, and silty clay. Perched ground water was reported to be present immediately south of the site at a depth between 4 and 6 feet below existing ground elevations, while static ground water south of the site was measured at a depth of 66 feet below existing ground elevations (España Geotechnical Consulting, 1999).

## **ANALYSIS AND IMPACTS**

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There are two types of impacts considered in this section. The first are geologic hazards, which could impact proper functioning of the proposed facility and include faulting and seismicity, liquefaction, dynamic compaction, hydrocompaction, subsidence, expansive soils, landslides, and tsunamis and seiches. The second considers potential impacts the proposed facility could have on existing geologic, mineralogic, and paleontologic resources in the area.

### **STAFF'S CRITERIA FOR DETERMINING IMPACT SIGNIFICANCE**

No federal LORS with respect to geologic hazards and geologic and mineralogic resources apply to this project; however, the CBSC and CBC provide geotechnical and geological investigation and design guidelines, which engineers must adhere to when designing a proposed facility. As a result, the criteria used to assess geologic hazard impact significance includes evaluating each potential hazard in relation to being able to adequately design and construct the proposed facility.

The California Environmental Quality Act (CEQA) Guidelines Appendix G provides a checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts.

- Section (V) (c) asks if the project will directly or indirectly destroy a unique paleontological resource or site or unique geological feature.
- Sections (VI) (a), (b), (c), (d), and (e) pose questions that are focused on whether or not the project would expose persons or structures to geologic hazards.
- Sections (X) (a) and (b) pose questions about the project's effect on mineral resources.

With respect to impacts the proposed facility may have on existing geologic and mineralogic resources, geologic and mineral resource maps for the surrounding area have been reviewed, in addition to any site-specific information provided by the applicant, to determine if geologic and mineralogic resources are present in the area. When available, operating procedures of the proposed facility, in particular ground water extraction and mass grading operations, are reviewed to determine if such operations could adversely impact such resources.

Staff reviewed existing paleontologic information for the surrounding area, as well as any site-specific information provided by the applicant, in accordance with accepted assessment protocol (SVP, 1995) to determine if there are any known paleontologic resources in the general area. If present or likely to exist, Conditions of Certification are applied to project approval, which outlines procedures required during construction to mitigate impacts to potential resources.

## **GEOLOGIC HAZARDS**

The AFC (ROSEVILLE, 2003a) provides documentation of potential geologic hazards at the REP plant site, in addition to subsurface exploration information (URS, 2001a). Review of the AFC, coupled with our independent research, indicates the potential for geologic hazards to impact the plant site are low.

Our independent research included review of available geologic maps, reports, and related data of the REP plant site. Geological information was available from the California Geological Survey (CGS), U. S. Geological Survey (USGS), and other governmental organizations.

### **Faulting and Seismicity**

Energy Commission staff reviewed the CGS publication *Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions*, dated 1994 (CGS, 1994); the *Geologic Map of the Sacramento Quadrangle* (Wagner et al., 1987); the *Simplified Fault Activity Map of California* (Jennings and Saucedo, 2002); the *Seismic Shaking Hazard Maps of California* (Petersen et al., 1999); *Summary of the Geology of the Great Valley* (Hackel, 1966); and the *Maps of Known Active Fault Near-Source Zones in California and Adjacent Parts of Nevada* (International Conference of Building Officials [ICBO], 1998). The project is located within Seismic Zone 3, as delineated on Figure 16-2 of the CBC. The closest known Holocene (active) faults are associated with the Foothills Fault System located approximately 16 miles from the site and the Concord-Green Valley fault located approximately 60 miles from the site. Energy Commission staff has calculated an estimated deterministic peak horizontal ground acceleration for the active faults in the vicinity of the project, including the two closest faults noted above, as 0.12g. As this acceleration is less than that required by the CBC (0.3g), a peak ground acceleration of 0.3g would be appropriate for use in design of structures at this site.

### **Liquefaction**

Liquefaction is a nearly complete loss of soil shear strength that can occur during a seismic event. During the seismic event, cyclic shear stresses cause the development of excessive pore water pressure between the soil grains, effectively reducing the internal strength of the soil. This phenomenon is generally limited to unconsolidated, clean to silty sand (up to 35 percent non-plastic fines) and very soft silts lying below the ground water table. The higher the ground acceleration caused by a seismic event, the more likely liquefaction is to occur. Severe liquefaction can result in catastrophic

settlements of overlying structural improvements and lateral spreading of the liquefied layer when confined vertically but not horizontally.

Ground water was encountered during exploration in the vicinity of the plant site at a depth of 66 feet below existing ground elevations; however, shallow perched ground water levels and layers of medium dense silty sand were also encountered (España Geotechnical Consulting, 1999; URS, 2001a). Such layers could be susceptible to liquefaction during the design earthquake (España Geotechnical Consulting, 1999; URS, 2001a). As a result, additional exploration and analyses are necessary to accurately assess this potential geologic hazard as outlined in **GEO-1**.

### **Dynamic Compaction**

Dynamic compaction of soils results when relatively unconsolidated granular materials experience vibration associated with seismic events. The vibration causes a decrease in soil volume, as the soil grains tend to rearrange into a more dense state (an increase in soil density). The decrease in volume can result in settlement of overlying structural improvements. Since the plant site is generally underlain by medium dense to dense silty sand and stiff to hard sandy silt, silt, and silty clay, the potential for dynamic compaction at the plant site is considered low.

### **Hydrocompaction**

Partially saturated soils can possess bonds that are a result of chemical precipitates that accumulate under semi-arid conditions. Such soluble compound bonds provide the soils with cohesion and rigidity; however, these bonds can be destroyed upon prolonged submergence. When destroyed, a substantial decrease in the material's void ratio is experienced even though the vertical pressure does not change. Materials that exhibit this decrease in void ratio and corresponding decrease in volume with the addition of water are defined as collapsible soils. Collapsible soils are typically limited to true loess, clayey loose sands, loose sands cemented by soluble salts, and windblown silts. Since the plant site is generally underlain by medium dense to dense silty sand and stiff to hard sandy silt, silt, and silty clay, the potential for hydrocompaction at the plant site is considered low.

### **Subsidence**

Ground subsidence is typically caused when ground water is drawn down by irrigation activities such that the effective unit weight of the soil mass is increased, which in turn increases the effective stress on underlying soils, resulting in consolidation/settlement of the underlying soils. The REP will obtain cooling water from tertiary treated recycled waste water from the adjacent Pleasant Grove Waste Water Treatment Plant (PGWWTP). As such, draw down of the water table due to REP operations is not anticipated. As a result, the potential for ground subsidence is considered low.

### **Expansive Soils**

Soil expansion occurs when clay-rich soils, with an affinity for water, exist in-place at a moisture content below their plastic limit. The addition of moisture from irrigation, capillary tension, water line breaks, etc. causes the clay soils to collect water molecules in their structure, which, in turn, causes an increase in the overall volume of the soil.

This increase in volume can correspond to movement of overlying structural improvements. As reported in the exploration logs, materials encountered in the project area consist of silty sand soils, as well as sandy silt, silt, and silty clay. The clay soils exhibit plasticity indices on the order 20 to 34, indicative of moderately expansive soils. As a result, there is a potential for expansive soils to be present near the surface of the site such that additional exploration and analyses are necessary to accurately assess this potential geologic hazard as outlined in **GEO-1**.

### **Landslides**

Landslides typically involve rotational slump failures within surficial soils/colluvium and/or weakened bedrock that are usually implemented by an increase of the material's moisture content above a layer, which exhibits a relatively low strength. Debris-flows are shallow landslides that travel downslope very rapidly as muddy slurry. The REP site is relatively flat with up to approximately 13 feet of relief over the plant site. As a result, the potential impact of landslides to the REP site is low.

### **Tsunamis and Seiches**

Tsunamis and seiches are earthquake-induced waves, which inundate low-lying areas adjacent to large bodies of water. The proposed site is situated approximately 82 to 95 feet above mean sea level and no large bodies of water are present near the REP site or associated alternative linear facilities. As a result, the potential for tsunamis and seiches to affect the site is considered negligible.

## **GEOLOGIC, MINERALOGIC, AND PALEONTOLOGIC RESOURCES**

Energy Commission staff have reviewed applicable geologic maps and reports for this area (CGS, 1980; Clark, 1998; CDMG, 1988; USGS, 1990; CDMG, 1999; DOGGR, 1982; Hackel, 1966; Helley and Harwood, 1985; Kohler, 2002; Wagner et al., 1987). Based on this information and the information contained in the AFC (ROSEVILLE, 2003a), there are no known geologic or mineralogic resources located at or immediately adjacent to the proposed REP site. The applicant's consultant conducted a paleontologic resources field survey and a sensitivity analysis for the REP site. No significant fossil fragments were observed at the REP site; however, paleobotanical fossils have been exposed in previous trenching operations near the site (URS, 2001b). The Riverbank Formation, which underlies the majority of the site, has been assigned a "high" sensitivity rating with respect to potentially containing paleontological resources. Based on this information and staff's review of available information (University of California, Berkeley, 2002), the proposed REP site has high potential to contain significant paleontologic resources.

## **PROJECT SPECIFIC IMPACTS**

Seismicity represents the main geologic hazard at this site. Conditions of Certification **GEN-1**, **GEN-5**, and **CIVIL-1** in the Facility Design section, as well as **GEO-1** of this section, should mitigate these impacts to a less than significant level. No geologic or mineralogic resources are known to exist in the area. Paleontologic resources have been documented in the area, and the (confidential) Paleontologic Resources Report (ROSEVILLE, 2003a) assigns a sensitivity rating of high for geologic units that underlie the proposed facility. Since the proposed project will include significant amounts of

grading and utility trenching, staff considers the probability that paleontologic resources will be encountered during mass grading of the REP site to be high based on SVP assessment criteria. Conditions of Certification **PAL-1** to **PAL-7** are designed to mitigate any paleontological resource impacts, as discussed above, to a less than significant level.

## **CUMULATIVE IMPACTS**

The REP site lies in an area that exhibits low geologic hazards and no known geologic or mineralogic resources. However, paleontological resources have been documented in the area. The potential impacts to paleontological resources due to construction activities will be mitigated as required by Conditions of Certification **PAL-1** to **PAL-7**.

Based on this information, it is staff's opinion that the potential for significant adverse cumulative impacts to the project from geologic hazards, and to potential geologic, mineralogic, and paleontologic resources from the proposed project, is low.

## **FACILITY CLOSURE**

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A definition and general approach to closure is presented in the **General Conditions** section of this assessment. Facility closure activities are not anticipated to impact geologic, mineralogic, or paleontologic resources. This is due to the fact that no such resources are known to exist at the proposed project site. In addition, decommissioning and closure of the power plant should not negatively affect geologic, mineralogic, or paleontologic resources since the majority of the ground disturbed in plant decommissioning and closure will have been disturbed during construction and operation of the facility.

## **CONCLUSIONS AND RECOMMENDATIONS**

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Based on staff's analysis the applicant will be able to comply with all applicable LORS, provided that the proposed Conditions of Certification are followed. The project should have no adverse impact with respect to design and construction of the project, and geologic, mineralogic, and paleontologic resources. Staff proposes to ensure compliance with applicable LORS through adoption of the proposed conditions of certification listed below.

## **PROPOSED CONDITIONS OF CERTIFICATION**

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General conditions of certification with respect to Geology are covered under Conditions of Certification **GEN-1**, **GEN-5**, and **CIVIL-1** in the **Facility Design** section, and include **GEO-1** below. Paleontological conditions of certification follow.

- GEO-1** The Soils Engineering Report required by the 2001 CBC Appendix Chapter 33, Section 3309.5 Soils Engineering Report, should specifically include data regarding the liquefaction potential and expansion potential of the site soils. The liquefaction analysis shall be implemented by following the recommended procedures contained in *Recommended Procedures for*

*Implementation of California Division of Mines and Geology Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction Hazards in California* dated March 1999.

**Verification:** The project owner shall include in the application for a grading permit a copy of the Soils Engineering Report which describes the collapse, expansion, and liquefaction potential of the site foundation soils and a summary of how the results of the analyses were incorporated into the project foundation and grading plan design for review and comment by the Chief Building Official (CBO). A copy of the Soils Engineering Report, application for grading permit and any comments by the CBO are to be provided to the CPM at least 30 days prior to grading.

**PAL-1** The project owner shall provide the Compliance Project Manager (CPM) with the resume and qualifications of its Paleontological Resource Specialist (PRS) for review and approval. If the approved PRS is replaced prior to completion of project mitigation and submittal of the Paleontological Resources Report, the project owner shall obtain CPM approval of the replacement PRS. The project owner shall submit to the CPM to keep on file, resumes of the qualified Paleontological Resource Monitors (PRMs). If a PRM is replaced, the resumes of the replacement PRM shall also be provided to the CPM.

The PRS resume shall include the names and phone numbers of references. The resume shall also demonstrate to the satisfaction of the CPM, the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Society of Vertebrate Paleontology (SVP) guidelines of 1995. The experience of the PRS shall include the following:

1. institutional affiliations, appropriate credentials and college degree,
2. ability to recognize and collect fossils in the field;
3. local geological and biostratigraphic expertise;
4. proficiency in identifying vertebrate and invertebrate fossils and;
5. at least three years of paleontological resource mitigation and field experience in California, and at least one year of experience leading paleontological resource mitigation and field activities.

The project owner shall ensure that the PRS obtains qualified paleontological resource monitors to monitor as he or she deems necessary on the project. Paleontologic resource monitors (PRMs) shall have the equivalent of the following qualifications:

- BS or BA degree in geology or paleontology and one year experience monitoring in California; or

- AS or AA in geology, paleontology or biology and four years experience monitoring in California; or
- Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

**Verification:** (1) At least 60 days prior to the start of ground disturbance, the project owner shall submit a resume and statement of availability of its designated PRS for on-site work.

(2) At least 20 days prior to ground disturbance, the PRS or project owner shall provide a letter with resumes naming anticipated monitors for the project and stating that the identified monitors meet the minimum qualifications for paleontological resource monitoring required by the condition. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to the CPM. The letter shall be provided to the CPM no later than one week prior to the monitor beginning on-site duties.

(3) Prior to the termination or release of a PRS, the project owner shall submit the resume of the proposed new PRS to the CPM for review and approval.

**PAL-2** The project owner shall provide to the PRS and the CPM, for approval, maps and drawings showing the footprint of the power plant, construction laydown areas, and all related facilities. Maps shall identify all areas of the project where ground disturbance is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS and CPM. The site grading plan and the plan and profile drawings for the utility lines would be acceptable for this purpose. The plan drawings shall show the location, depth, and extent of all ground disturbances and should be of such a scale to allow the PRS to determine and map fossil occurrences. If the footprint of the power plant or linear facility changes, the project owner shall provide maps and drawings reflecting these changes to the PRS and CPM.

If construction of the project will proceed in phases, maps and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the PRS and CPM. Prior to work commencing on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

At a minimum, the project owner shall ensure that the PRS or PRM consults weekly with the project superintendent or construction field manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.

**Verification:** (1) At least 30 days prior to the start of ground disturbance, the project owner shall provide the maps and drawings to the PRS and CPM.

(2) If there are changes to the footprint of the project, revised maps and drawings shall be provided to the PRS and CPM at least 15 days prior to the start of ground disturbance.

(3) If there are changes to the scheduling of the construction phases, the project owner shall submit a letter to the CPM within 5 days of identifying the changes.

**PAL-3** The project owner shall ensure that the PRS prepares, and the project owner submits to the CPM for review and approval, a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting and sampling activities and may be modified with CPM approval. This document shall be used as a basis for discussion in the event that on-site decisions or changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's on-site manager, and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the Society of Vertebrate Paleontology (SVP, 1995) and shall include, but not be limited to, the following:

1. Assurance that the performance and sequence of project-related tasks, such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking, construction monitoring, mapping and data recovery, fossil preparation and collection, identification and inventory, preparation of final reports, and transmittal of materials for curation will be performed according to the PRMMP procedures;
2. Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and the Conditions of Certification;
3. A thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;
4. A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed schedule for the monitoring and sampling;
5. A discussion of the procedures to be followed in the event of a significant fossil discovery, halting construction, resuming construction, and how notifications will be performed;
6. A discussion of equipment and supplies necessary for collection of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;



7. Procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontology standards and requirements for the curation of paleontological resources;
8. Identification of the institution that has agreed to receive any data and fossil materials collected, requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution; and
9. A copy of the paleontological Conditions of Certification.

**Verification:** At least 30 days prior to ground disturbance, the project owner shall provide two copies of the PRMMP to the CPM. The PRMMP shall include an affidavit of authorship by the PRS, and acceptance of the PRMMP by the project owner evidenced by a signature.

**PAL-4** Prior to ground disturbance and for the duration of construction, the project owner and the PRS shall prepare and conduct weekly CPM-approved training for all recently employed project managers, construction supervisors and workers who are involved with or operate ground disturbing equipment or tools and who have not previously had the training. Workers shall not excavate in sensitive units prior to receiving CPM-approved worker training. Worker training shall consist of an initial in-person PRS training during the project kick-off for those mentioned above. Following initial training, a CPM-approved video or in-person training may be used for new employees. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

The Worker Environmental Awareness Program (WEAP) shall address the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. Good quality photographs or physical examples of vertebrate fossils shall be provided for project sites containing units of high sensitivity;
3. Information that the PRS or PRM has the authority to halt or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;
4. Instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;
5. An informational brochure that identifies reporting procedures in the event of a discovery;

6. A Certification of Completion of WEAP form signed by each worker indicating that they have received the training; and
7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

**Verification:** (1) At least 30 days prior to ground disturbance, the project owner shall submit two copies of the proposed WEAP including the brochure with the set of reporting procedures the workers are to follow.

(2) At least 30 days prior to ground disturbance, the project owner shall submit the script and final video to the CPM for approval if the project owner is planning on using a video for interim training.

(3) If an alternate paleontological trainer is requested by the project owner, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval prior to installation of the alternate trainer. Alternate trainers shall not conduct training prior to CPM authorization.

(4) In the Monthly Compliance Report (MCR) the project owner shall provide copies of the WEAP Certification of Completion forms with the names of those trained and the trainer or type of training offered that month. The MCR shall also include a running total of all persons who have completed the training to date.

**PAL-5** The project owner shall ensure that the PRS and PRM(s) monitor consistently with the PRMMP all construction-related grading, excavation, trenching, and augering in areas where potentially fossil-bearing materials have been identified. In the event that the PRS determines full time monitoring is not necessary in locations that were identified as potentially fossil-bearing in the PRMMP, the project owner shall notify and seek the concurrence of the CPM.

The project owner shall ensure that the PRS and PRM(s) have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

1. Any change of monitoring different from the accepted program presented in the PRMMP shall be proposed in a letter or email from the PRS and the project owner to the CPM prior to the change in monitoring. The letter or email shall include the justification for the change in monitoring and be submitted to the CPM for review and approval.
2. The project owner shall ensure that the PRM(s) keeps a daily log of monitoring of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.
3. The project owner shall ensure that the PRS immediately notifies the CPM of any incidents of non-compliance with any paleontological resources Conditions of Certification. The PRS shall recommend corrective action to

resolve the issues or achieve compliance with the Conditions of Certification.

4. For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM immediately (no later than the following morning after the find, or Monday morning in the case of a weekend) of any halt of construction activities.

The project owner shall ensure that the PRS prepares a summary of the monitoring and other paleontological activities that will be placed in the Monthly Compliance Reports (MCR). The summary will include the name(s) of PRS or PRM(s) active during the month, general descriptions of training and monitored construction activities and general locations of excavations, grading, etc. A section of the report shall include the geologic units or subunits encountered; descriptions of sampling within each unit; and a list of identified fossils. A final section of the report shall address any issues or concerns about the project relating to paleontologic monitoring including any incidents of non-compliance and any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the report shall include an explanation in the summary as to why monitoring was not conducted.

**Verification:** The project owner shall ensure that the PRS submits the summary of monitoring and paleontological activities in the MCR. When feasible, the CPM shall be notified 10 days in advance of any proposed changes in monitoring different from the plan identified in the PRMMP. If there is any unforeseen change in monitoring, the notice shall be given as soon as possible prior to implementation of the change.

**PAL-6** The project owner, through the designated PRS, shall ensure that all components of the PRMMP are adequately performed including collection of fossil materials, preparation of fossil materials for analysis, analysis of fossils, identification and inventory of fossils, the preparation of fossils for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during the project construction.

**Verification:** The project owner shall maintain in their compliance file copies of signed contracts or agreements with the designated PRS and other qualified research specialists. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontological Resource Report (See **PAL-7**). A signed contract or agreement with the PRS shall be provided to the CPM upon request. The project owner shall be responsible to pay any curation fees charged by the museum for fossils collected and curated as a result of paleontological mitigation. A copy of the letter of transmittal submitting the fossils to the curating institution shall be provided to the CPM.

**PAL-7** The project owner shall ensure preparation of a Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following completion of the ground disturbing activities. The PRR shall include an analysis of the collected fossil materials and related information and submitted to the CPM for review and approval.

The report shall include, but is not limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the PRS that project impacts to paleontological resources have been mitigated.

**Verification:** Within 90 days after completion of ground disturbing activities, including landscaping, the project owner shall submit the Paleontological Resources Report under confidential cover to the CPM.

**Certification of Completion of Worker  
Environmental Awareness Program  
ROSEVILLE ENERGY PARK (03-AFC-1)**

This is to certify these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on Cultural, Paleontology and Biological Resources for all personnel (i.e. construction supervisors, crews and plant operators) working on-site or at related facilities. By signing below, the participant indicates that they understand and shall abide by the guidelines set forth in the Program materials. Please include this completed form in the Monthly Compliance Report.

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Bio Trainer: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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# **POWER PLANT EFFICIENCY**

Shahab Khoshmashrab

## **INTRODUCTION**

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The Energy Commission, in its decision, must make findings as to whether energy use by the Roseville Energy Park (REP) will result in significant adverse impacts on the environment, as defined in the California Environmental Quality Act (CEQA). If the Energy Commission finds that the REP's consumption of energy would create a significant adverse impact, it must determine whether there are any feasible mitigation measures that could eliminate or minimize the impacts. In this analysis, staff addresses the issue of inefficient and unnecessary consumption of energy.

In order to support the Energy Commission's findings, this analysis will:

- examine whether the facility will likely present any adverse impacts upon energy resources;
- examine whether these adverse impacts are significant; and if so,
- examine whether feasible mitigation measures exist that would eliminate the adverse impacts, or reduce them to a level of insignificance.

## **LAWS, ORDINANCES, REGULATIONS AND STANDARDS**

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### **FEDERAL**

No federal LORS apply to the efficiency of this project.

### **STATE**

No State LORS apply to the efficiency of this project.

### **LOCAL**

No local or county ordinances apply to power plant efficiency.

## **SETTING**

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The applicant proposes to construct and operate the combined-cycle REP to generate 120 to 125 MW of baseload power (nominal net output, baseload) and 160 MW (nominal net output, peaking) of load-following power, providing power to the Roseville Electric customers (Roseville 2003a, AFC §§ 1.1, 2.1, 2.2.2, 2.2.16). (Note that this nominal rating is based upon preliminary design information and generating equipment manufacturers' guarantees. The project's actual maximum generating capacity may differ from this figure.) As proposed, the REP will consist of two General Electric (GE) LM6000PC Sprint or two Alstom GTX100 combustion gas turbines with inlet air evaporative coolers, inlet air filters, two dual-pressure heat recovery steam generators (HRSGs) with duct burners, and a single 2-pressure, non-reheat, condensing steam



turbine generator arranged in a two-on-one combined cycle train (Roseville 2003a, AFC §§ 1.1, 2.2.2, 2.2.4). GE LM6000 gas turbines use a water injection system to increase power and lower NO<sub>x</sub> emissions. Alstom GTX100 gas turbines use dry low-NO<sub>x</sub> combustors to control NO<sub>x</sub> emissions and use no water injection for either emissions control or increasing power output. The HRSGs will be equipped with selective catalytic reduction to control air emissions (Roseville 2003a, AFC §§ 1.1, 2.2.2, 2.2.4.1, 2.2.4.2, 2.2.11). Natural gas will be transmitted to the plant via an approximately 6-mile section of 10- to 16-inch diameter pipeline connected to PG&E's gas supply line 123 (Roseville 2003a, AFC §§ 1.1, 2.2.6, 2.2.18.3, 5.0, 10.2.1).

## **ANALYSIS**

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CEQA Guidelines state that the environmental analysis "...shall describe feasible measures which could minimize significant adverse impacts, including where relevant, inefficient and unnecessary consumption of energy" (Cal. Code Regs., tit. 14, § 15126.4(a)(1)). Appendix F of the Guidelines further suggests consideration of such factors as the project's energy requirements and energy use efficiency; its effects on local and regional energy supplies and energy resources; its requirements for additional energy supply capacity; its compliance with existing energy standards; and any alternatives that could reduce wasteful, inefficient and unnecessary consumption of energy (Cal. Code regs., tit. 14, § 15000 et seq., Appendix F).

## **ADVERSE IMPACTS ON ENERGY RESOURCES**

The inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas and oil, constitutes an adverse environmental impact. An adverse impact can be considered significant if it results in:

- adverse effects on local and regional energy supplies and energy resources;
- a requirement for additional energy supply capacity;
- noncompliance with existing energy standards; or
- the wasteful, inefficient and unnecessary consumption of fuel or energy.

### **Project Energy Requirements And Energy Use Efficiency**

Any power plant large enough to fall under Energy Commission siting jurisdiction will consume large amounts of energy. Under average ambient conditions, the REP would burn natural gas at a nominal rate of 19,820 million Btu per day, lower heating value (LHV) without HRSG duct firing. (Roseville 2003a, AFC § 2.2.6). This is a substantial rate of energy consumption, and holds the potential to impact energy supplies. Under expected project conditions, using GE LM6000 gas turbines, at maximum baseload operation, 120 MW of electricity would be generated at an efficiency of approximately 50.5 percent LHV without duct burning (Roseville 2003a, AFC § 2.2.2, Figure 2.2-4). Under the same conditions, using Alstom GTX100 gas turbines, at maximum baseload operation, 125 MW of electricity would be generated at an efficiency of approximately 51.6 percent LHV without duct burning (Roseville 2003a, AFC § 2.2.2, Figure 2.2-5); compare these to the average fuel efficiency of a typical utility company baseload power plant at approximately 35 percent LHV. With duct firing, at average ambient conditions, REP would be able to generate a nominal output of 160 MW (using either the LM6000

or the GTX100 machines) (Roseville 2003a, AFC § 2.2.2). At this rate, the full load efficiency would be approximately 35.7 to 38.6 percent LHV, which is comparable to, if not higher than, that of a gas turbine operating in simple cycle.

### **Adverse Effects On Energy Supplies And Resources**

The applicant has described its sources of supply of natural gas for the project (Roseville 2003a, AFC §§ 1.1, 2.2.6, 2.2.18.3, 5.0, 10.2.1). Natural gas for the REP will be supplied from the existing PG&E gas distribution system from line 123. The PG&E natural gas system has access to gas from the Rocky Mountains, Canada and the Southwest. This represents a resource of considerable capacity. Furthermore, the PG&E gas supply represents an adequate source for a project of this size. A letter from PG&E that accompanied Data Response 39 confirms that PG&E's system will be able and ready to provide the necessary quantities of natural gas for the REP (CH2MHill 2004a). It is, therefore, highly unlikely that the project could pose a substantial increase in demand for natural gas in California.

### **Additional Energy Supply Requirements**

Natural gas fuel will be supplied to the project by PG&E line 123 via a new approximately 6-mile section of 10- to 16-inch diameter pipeline (Roseville 2003a, AFC §§ 1.1, 2.2.6, 2.2.18.3, 5.0, 10.2.1). This is a resource with adequate delivery capacity for a project of this size. There is no real likelihood that the REP will require the development of additional energy supply capacity.

### **Compliance With Energy Standards**

No standards apply to the efficiency of the REP or other non-cogeneration projects.

### **Alternatives To Reduce Wasteful, Inefficient And Unnecessary Energy Consumption**

The REP could be deemed to create significant adverse impacts on energy resources if alternatives existed that would reduce the project's use of fuel. Evaluation of alternatives to the project that could reduce wasteful, inefficient or unnecessary energy consumption first requires examination of the project's energy consumption. Project fuel efficiency, and therefore its rate of energy consumption, is determined by the configuration of the power producing system and by the selection of equipment used to generate power.

### **Project Configuration**

As proposed, the REP will be configured as a combined cycle power plant, in which electricity is generated by two gas turbines, and additionally by a steam turbine that operates on heat energy recuperated from the gas turbines' exhaust (Roseville 2003a, AFC §§ 1.1, 2.1, 2.2.2, 2.2.3, 2.2.4). By recovering this heat, which would otherwise be lost up the exhaust stacks, the efficiency of any combined cycle power plant is increased considerably from that of either gas turbines or steam turbines operating

alone. Such a configuration is well suited to the large, steady loads met by a baseload plant, intended to supply energy efficiently for long periods of time.

The applicant proposes to use inlet air evaporative coolers, HRSG duct burners (re-heaters), two-pressure HRSGs and steam turbine, and a circulating water system (Roseville 2003a, AFC §§ 1.1, 2.2.2, 2.2.3, 2.2.4). Staff believes these features contribute to meaningful efficiency enhancement of the REP. The two-train combustion turbine (CT)/HRSG configuration also allows for high efficiency during unit turndown because a single fully loaded CT is more efficient than two CTs operating at 50 percent load.

The REP includes HRSG duct burners, partially to replace heat to the steam turbine (ST) cycle during high ambient temperatures when CT capacity drops, and partially as added power. Duct firing also provides a number of operational benefits, such as load following and balancing and optimizing the operation of the ST cycle.

### **Equipment Selection**

Modern gas turbines embody the most fuel-efficient electric generating technology available today. Both the GE LM6000PC Sprint and Alstom GTX100 turbines represent two of the most modern and efficient such machines now available. The applicant will employ two GE LM6000PC Sprint or two Alstom GTX100 gas turbine generators in a two-on-one combined cycle power train (Roseville 2003a, AFC §§ 1.1, 2.2.2, 2.2.4, 2.2.18.2). The GE LM6000PC Sprint gas turbine in a one-on-one configuration (the only configuration for which GTW combined cycle efficiency data is available) is nominally rated at 59 MW and 53 percent efficiency LHV at ISO conditions (GTW 2003). The Alstom GTX100 in a two-on-one configuration is nominally rated at 124.5 MW and 54 percent efficiency LHV at ISO conditions (GTW 2003).

### **Efficiency Of Alternatives To The Project**

The project objectives include generation of baseload electricity and ancillary services, as market conditions dictate (Roseville 2003a, AFC §§ 1.3, 2.2.16, 2.2.18.1, 10.2.2).

### ***Alternative Generating Technologies***

Alternative generating technologies for the REP are considered in the AFC (Roseville 2003a, AFC § 9.6). Fossil fuels, geothermal, biomass, solar, hydroelectric, and wind technologies are all considered. Given the project objectives, location, and air pollution control requirements, staff agrees with the applicant that only natural gas-burning technologies are feasible.

### ***Natural Gas-Burning Technologies***

Fuel consumption is one of the most important economic factors in selecting an electric generator; fuel typically accounts for over two-thirds of the total operating costs of a fossil-fired power plant (Power 1994). Under a competitive power market system, where operating costs are critical in determining the competitiveness and profitability of a power plant, the plant owner is thus strongly motivated to purchase fuel-efficient machinery.

Capital cost is also important in selecting generating machinery. Recent progress in the development of gas turbines, incorporating technological advances made in the development of aircraft (jet) engines, combined with the cost advantages of assembly-line manufacturing, has made available machines that not only offer the lowest available fuel costs, but at the same time sell for the lowest per-kilowatt capital cost.

Roseville Electric has considered employing the GE LM6000PC Sprint or Alstom GTX100 gas turbine, two of the most modern simple cycle gas turbine generators available. The LM6000PC Sprint gas turbine generator in a one-on-one combined cycle power train is nominally rated at 59 MW and 53 percent LHV at ISO conditions (GTW 2003). The LM6000PC Sprint is further enhanced by the incorporation of spray intercooling (thus the name, SPRay INTERcooling). This takes advantage of the aeroderivative machine's two-stage compressor. By spraying water into the airstream between the two compressor stages, the partially compressed air is cooled, reducing the amount of work that must be performed by the second stage compressor. This reduces the power consumed by the compressor, yielding greater net power output and higher fuel efficiency. The benefits in generating capacity and fuel efficiency increase with rising ambient air temperatures. At temperatures above 90°F, the Sprint machine enjoys a four-percent increase in both power output and efficiency (GTW 2000). The Alstom GTX100 gas turbine generator in a two-on-one combined cycle power train is nominally rated at 124.5 MW and 54 percent LHV at ISO conditions (GTW 2003).

One possible alternative that can meet the project's objectives is the FT8, which is an aeroderivative machine adapted from Pratt & Whitney aircraft engines. This machine in a two-on-one combined cycle power train configuration is nominally rated at 74 MW (baseload) and 51 percent efficiency LHV at ISO conditions (GTW 2003).

Another alternative is the General Electric frame 7EA (GE 7EA), which is nominally rated at 130 MW (baseload) and 50 percent efficiency LHV at ISO conditions in a one-on-one combined cycle configuration (GTW 2003).

Machine	Generating Capacity (MW)	ISO Efficiency (LHV)
<b>ALSTOM GTX100</b>	<b>124.5</b>	<b>54 %</b>
<b>GE LM6000PC Sprint</b>	<b>56</b>	<b>53 %</b>
P & W Twin FT8 Plus	74	51 %
GE 7EA	130	50 %

Source: GTW 2003

The alternative machines (P & W Twin FT8 Plus and GE 7EA) are slightly less efficient than both the LM6000 and the Alstom GTX100.

In order to meet the project's generating capacity requirement, the only configuration suitable for the GE 7EA would have to be a one-on-one configuration. This configuration, in comparison to the two-on-one configuration, would result in lower efficiency during unit turndown because a single fully loaded CT is more efficient than one CT operating at 50 percent load.

### ***Inlet Air Cooling***

A further choice of alternatives involves the selection of gas turbine inlet air cooling methods. The two commonly used techniques are the evaporative cooler or fogger, and the chiller; both devices increase power output by cooling the gas turbine inlet air. A mechanical chiller can offer greater power output than the evaporative cooler on hot, humid days, but consumes electric power to operate its refrigeration process, thus slightly reducing overall net power output and, thus, overall efficiency. An absorption chiller uses less electric power, but necessitates the use of a substantial inventory of ammonia. An evaporative cooler or a fogger boosts power output best on dry days; it uses less electric power than a mechanical chiller, possibly yielding slightly higher operating efficiency. The difference in efficiency among these techniques is relatively insignificant.

The applicant proposes to employ inlet air evaporative cooling (Roseville 2003a, AFC §§ 2.2.2, 2.2.4.1, 9.6.4). Given the climate at the project site and the relative lack of clear superiority of one system over the other, staff agrees that the applicant's approach will yield no significant adverse energy impacts.

In conclusion, the project configuration (two-on-one combined cycle) and generating equipment chosen appear to represent the most efficient feasible combination to satisfy the project objectives. There are no alternatives that could significantly reduce energy consumption.

### **CUMULATIVE IMPACTS**

There are no nearby power plant projects that hold the potential for cumulative energy consumption impacts when aggregated with the project. Staff knows of no other projects that could result in cumulative energy impacts.

Staff believes that construction and operation of the project will not bring about indirect impacts, in the form of additional fuel consumption, that would not have occurred but for the project. The older, less efficient power plants consume more natural gas to operate than the new, more efficient plants such as the REP. The high efficiency of the proposed REP should allow it to compete very favorably, running at a high capacity factor, replacing less efficient power generating plants, and therefore not having an impact or even reducing the cumulative amount of natural gas consumed for power generation.

### **FACILITY CLOSURE**

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Closure of the facility, whether planned or unplanned, will not influence, nor will it be influenced by, project efficiency. Any efficiency impacts due to closure of the project would be on the electric system as a whole. Yet the vast size of the electric system serving California, the number of generating plants offering to sell power into it, and the existence of the California Independent System Operator to ensure the efficient management of the system, all lend assurance that closure of this facility will not produce significant adverse impacts on efficiency.

## CONCLUSIONS AND RECOMMENDATIONS

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### CONCLUSIONS

The project, if constructed and operated as proposed, would generate a nominal 120 to 125 MW of baseload electric power, and a nominal 160 MW of peaking power, at an overall project fuel efficiency between 35.7 percent LHV at maximum full load (with duct firing) and 51.6 percent LHV at maximum baseload (without duct firing). While it will consume substantial amounts of energy, it will do so in the most efficient manner practicable. It will not create significant adverse effects on energy supplies or resources, will not require additional sources of energy supply, and will not consume energy in a wasteful or inefficient manner. No energy standards apply to the project. Staff therefore concludes that the project would present no significant adverse impacts upon energy resources.

No cumulative impacts on energy resources are likely. Facility closure would not likely present significant impacts on electric system efficiency.

### RECOMMENDATION

No Conditions of Certification are proposed.

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# POWER PLANT RELIABILITY

Shahab Khoshmashrab

## INTRODUCTION

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In this analysis, Energy Commission staff addresses the reliability issues of the project to determine if the power plant is likely to be built in accordance with typical industry norms for reliability of power generation. Staff uses this level of reliability as a benchmark because it ensures that the resulting project would likely not degrade the overall reliability of the electric system it serves (see **Setting** below).

The scope of this power plant reliability analysis covers:

- equipment availability;
- plant maintainability;
- fuel and water availability; and
- power plant reliability in relation to natural hazards.

Staff examined the project design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliability of power generation. While Roseville Electric has predicted a 95 percent annual availability for the Roseville Energy Park (REP) (see below), staff uses the benchmark identified above, rather than Roseville Electric's projection, to evaluate the project's reliability.

## LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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Presently, there are no laws, ordinances, regulations or standards (LORS) that establish either power plant reliability criteria or procedures for attaining reliable operation. However, the commission must make findings as to the manner in which the project is to be designed, sited and operated to ensure safe and reliable operation (Cal. Code Regs., tit. 20, § 1752(c)). Staff takes the approach that a project is acceptable if it does not degrade the reliability of the utility system to which it is connected. This is likely the case if the project exhibits reliability at least equal to that of other power plants on that system (see **Setting** below).

## SETTING

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The responsibility for overseeing system reliability falls largely to the Western Electricity Coordinating Council (WECC), an entity that is responsible for coordinating and promoting electric system reliability throughout the nine western states. The WECC has reliability, operating, and planning standards, criteria and guidelines necessary to maintain the reliable operation of the Western Interconnection's interconnected bulk power system. As a member of the WECC, the applicant should adhere to the guidelines of the WECC and the North American Electric Reliability Council (NERC) in order to supply Roseville Electric's customers with a reliable source of power.

As part of its plan to provide needed reliability, the applicant proposes to operate the 160 MW (nominal peak load output) REP, providing power to the Roseville Electric customers (Roseville 2003a, AFC §§ 1.1, 2.1, 1.3). The project is expected to operate at an overall availability of 95 percent (Roseville 2003a, AFC §§ 2.2.2, 2.2.16), and at a capacity factor, over the life of the plant, of 30 to 100 percent of base load (Roseville 2003a, AFC §§ 2.2.18.1, 10.2.2).

## **ANALYSIS**

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The availability factor for a power plant is the percentage of the time that it is available to generate power; both planned and unplanned outages subtract from its availability. Measures of power plant reliability are based on its actual ability to generate power when it is considered available and are based on starting failures and unplanned, or forced, outages. For practical purposes, reliability can be considered a combination of these two industry measures, making a reliable power plant one that is available when called upon to operate. Throughout its intended 30-year life (Roseville 2003a, AFC §§ 2.2.18.1, 10.2.2), the REP will be expected to perform reliably. Power plant systems must be able to operate for extended periods without shutting down for maintenance or repairs. Achieving this reliability is accomplished by ensuring adequate levels of equipment availability, plant maintainability with scheduled maintenance outages, fuel and water availability, and resistance to natural hazards. Staff examines these factors for the project and compares them to industry norms. If they compare favorably, staff can conclude that the REP will be as reliable as other power plants on the electric system, and will therefore not degrade system reliability.

### **EQUIPMENT AVAILABILITY**

Equipment availability will be ensured by use of appropriate quality assurance/quality control (QA/QC) programs during design, procurement, construction and operation of the plant, and by providing for adequate maintenance and repair of the equipment and systems (discussed below).

#### **Quality Control Program**

The applicant describes a QA/QC program (Roseville 2003a, AFC § 2.2.18.5) typical of the power industry. Equipment will be purchased from qualified suppliers, based on technical and commercial evaluations. Suppliers' personnel, production capability, past performance, QA programs and quality history will be evaluated. The project owner will perform receipt inspections, test components, and administer independent testing contracts. Staff expects implementation of this program to yield typical reliability of design and construction. To ensure such implementation, staff has proposed appropriate conditions of certification under the portion of this document entitled **Facility Design**.

### **PLANT MAINTAINABILITY**

#### **Equipment Redundancy**

A generating facility called on to operate in baseload service for long periods of time must be capable of being maintained while operating. A typical approach for achieving



this is to provide redundant examples of those pieces of equipment most likely to require service or repair.

The applicant plans to provide appropriate redundancy of function for the combined cycle portion of the project (Roseville 2003a, AFC §§ 1.1, 2.2.2, 2.2.4, 2.2.5, 2.2.13, 2.2.18.2, 10.2.2, Table 2.2-4). The fact that the project consists of two trains of gas turbine generators/HRSGs provides inherent reliability. Failure of a non-redundant component of one train should not cause the other train to fail, thus allowing the plant to continue to generate (at reduced output). Further, the plant's distributed control system (DCS) will be built with typical redundancy. Emergency DC and AC power systems will be supplied by redundant batteries, chargers, and inverters. Other balance of plant equipment will be provided with redundant examples, including:

- two 100 percent feedwater pumps per HRSG;
- three 50 percent condensate pumps;
- two 50 percent circulating water pumps; and
- three 50 percent natural gas compressors.

With this opportunity for continued operation in the face of equipment failure, staff believes that equipment redundancy will be sufficient for a project such as this.

### **Maintenance Program**

The applicant proposes to establish a preventive plant maintenance program typical of the industry (Roseville 2003a, AFC §§ 2.2.18.5, 10.2.2). Equipment manufacturers provide maintenance recommendations with their products; the applicant will base its maintenance program on these recommendations. The program will encompass preventive and predictive maintenance techniques. Maintenance outages will be planned for periods of low electricity demand. In light of these plans, staff expects that the project will be adequately maintained to ensure acceptable reliability.

## **FUEL AND WATER AVAILABILITY**

For any power plant, the long-term availability of fuel and of water for cooling or process use is necessary to ensure reliability. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant may be curtailed, threatening the supply of power as well as the economic viability of the plant.

### **Fuel Availability**

The REP will burn natural gas from the Pacific Gas and Electric (PG&E) distribution system. Natural gas will be transmitted to the plant via an approximately six-mile section of 10- to 16-inch diameter pipeline connected to the PG&E gas supply system (Roseville 2003a, AFC §§ 1.1, 2.2.6, 2.2.18.3, 5.0, 10.2.1). This PG&E natural gas system represents a resource of considerable capacity and offers access to adequate supplies of gas. A letter from PG&E that accompanied Data Response 39 confirms that PG&E's system will be able and ready to provide the necessary quantities of natural gas for the REP (CH2MHill 2004a). Staff agrees with the applicant's prediction that there will be adequate natural gas supply and pipeline capacity to meet the project's needs.

## **Water Supply Reliability**

The REP will obtain recycled water for cooling tower make-up from the City of Roseville's adjacent Pleasant Grove Waste Water Treatment Plant via a new 50-foot-long 12- to 24-inch diameter pipeline (Roseville 2003a, AFC §§ 1.1, 2.2.7, 2.2.18.4, 7.0). The applicant predicts average process and cooling water consumption of approximately 491 gallons per minute (gpm) at baseload under average ambient conditions. Potable water will be provided by an existing well located on the REP site, initially, and later by the City water main when the West Roseville Specific Plan is developed (TID 2002a, AFC §§ 1.1, 2.2.7, 7.0). Staff believes these sources yield sufficient likelihood of a reliable supply of water. (For further discussion of water supply, see the **Soil and Water Resources** section of this document.)

## **POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS**

Natural forces can threaten the reliable operation of a power plant. High winds, tsunamis (tidal waves), and seiches (waves in inland bodies of water) will not likely represent a hazard for this project, but seismic shaking (earthquake) and flooding present credible threats to reliable operation.

### **Seismic Shaking**

The site lies within Seismic Zone 3 (Roseville 2003a, AFC §§ 2.2.17.1, 8.4.1.5); see that portion of this document entitled **Geology, Mineral Resources, and Paleontology**. The project will be designed and constructed to the latest appropriate LORS (Roseville 2003a, AFC §§ 2.2.17.1, 8.4, 10.2.2, Appendix 10). Compliance with current LORS applicable to seismic design represents an upgrading of performance during seismic shaking compared to older facilities, due to the fact that these LORS have been periodically and continually upgraded. By virtue of being built to the latest seismic design LORS, this project will likely perform at least as well as, and perhaps better than, existing plants in the electric power system. Staff has proposed conditions of certification to ensure this; see that portion of this document entitled **Facility Design**. In light of the historical performance of California power plants and the electrical system in seismic events, staff believes there is no special concern with power plant functional reliability affecting the electric system's reliability due to seismic events.

### **Flooding**

Site average elevation is approximately 93 feet above mean sea level and the site is not within the 100-year flood plain. Storm Water Pollution Prevention Plan and Best Management Practices will be implemented during construction and operation to control erosion and sedimentation (Roseville 2003a, AFC §§ 2.2.17.1, 8.15.1.3, 8.15.4). Staff believes there are no concerns with the power plant functional reliability due to flooding events. For further discussion, see **Soil and Water Resources**.

## **COMPARISON WITH EXISTING FACILITIES**

Industry statistics for availability factors (as well as many other related reliability data) are kept by the North American Electric Reliability Council (NERC). NERC continually polls utility companies throughout the North American continent on project reliability data through its Generating Availability Data System (GADS), and periodically summarizes and publishes the statistics on the Internet (<http://www.nerc.com>). NERC

reports the following summary generating unit statistics for the years 1998 through 2002 (NERC 2003):

**For Combined Cycle units (All MW sizes)**

Availability Factor = 89.95 percent

The gas turbines that will be employed in the project have been on the market for several years now, and can be expected to exhibit typically high availability. The applicant's prediction of an annual availability factor of 95 percent (Roseville 2003a, AFC §§ 2.2.2, 2.2.16) appears reasonable compared to the NERC figure for similar plants throughout North America (see above). In fact, these new machines can well be expected to outperform the fleet of various (mostly older) gas turbines that make up the NERC statistics. Further, since the plant will consist of two parallel gas turbine generating trains, maintenance can be scheduled during those times of year when the full plant output is not required to meet market demand, typical of industry standard maintenance procedures. The applicant's estimate of plant availability, therefore, appears realistic. The stated procedures for assuring design, procurement and construction of a reliable power plant appear to be in keeping with industry norms, and staff believes they are likely to yield an adequately reliable plant.

## **FACILITY CLOSURE**

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Closure of the facility, whether planned or unplanned, cannot impact power plant reliability. Reliability impacts on the electric system from facility closure, should there be any, are discussed in the **Transmission System Engineering** section of this document.

## **CONCLUSION**

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Roseville Electric predicts an equivalent availability factor of 95 percent, which staff believes is achievable. Based on a review of the proposal, staff concludes that the plant will be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability. No Conditions of Certification are proposed.

## **REFERENCES**

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# TRANSMISSION SYSTEM ENGINEERING

Laiping Ng and Al McCuen

## SUMMARY OF CONCLUSIONS

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Roseville Electric, the municipal electric utility of the City of Roseville, proposes to construct a nominal net generating capacity of 120 to 125 megawatt (MW), with the ability to peak-fire to 160 MW, natural gas-fired combined cycle generating facility. With a 60 kV switchyard, the Roseville Electric Park (REP or project) would be located in the City of Roseville, Placer County. The project would connect to Roseville Electric's system via a new 100-foot 60 kV double circuit line. Staff concludes that the switchyard, outlet lines and termination are acceptable and will comply with applicable Laws, Ordinances, Regulations and Standards. No additional new transmission facilities other than those proposed by the applicant for the direct interconnection are required for interconnection of the REP. The marginal adverse impacts found in the Western and SMUD transmission grids due to interconnection of the REP can be mitigated effectively by Remedial Action Schemes, and operational procedures.

## INTRODUCTION

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The Transmission System Engineering (TSE) analysis identifies whether or not the transmission facilities associated with the proposed project conform to all applicable laws, ordinances, regulations, and standards (LORS), required for safe and reliable electric power transmission, and assesses whether or not the applicant has accurately identified all interconnection facilities required as a result of the project.

Staff's analysis evaluates the power plant switchyard, outlet lines, termination and downstream facilities identified by the applicant and provides proposed conditions of certification to ensure the project complies with applicable LORS during the design review, construction, operation and potential closure of the project.

Additionally, under the California Environmental Quality Act (CEQA), the Energy Commission must conduct an environmental review of the "whole of the action," which may include facilities not licensed by the Energy Commission (Cal. Code Reg., tit. 14, §15378). Therefore, the Energy Commission must identify and evaluate the environmental effect of construction and operation of any new or modified transmission facilities required for the project's interconnection to the electric grid. This evaluation must include any facilities beyond the project's interconnection with the existing transmission system, though such facilities are not under the permit authority of the Energy Commission, that are required as a result of the power plant addition to the California transmission system.

Because the Roseville Electric system is not a part of the California Independent System Operator (Cal-ISO) grid, the Cal-ISO is not directly responsible for ensuring electric system reliability for the generator interconnection and will not provide analysis and testimony for this project. Staff coordinates with the Cal-ISO and solicits their input. Staff therefore has increased responsibility to evaluate the system reliability impacts of the project and provide conclusions and recommendations to the Energy Commission.

## LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

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- California Public Utilities Commission (CPUC) General Order 95 (GO-95), “Rules for Overhead Electric Line Construction,” formulates uniform requirements for construction of overhead lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction, maintenance, operation, or use of overhead electric lines and to the public in general.
- Western Systems Coordinating Council (WSCC) Reliability Criteria provide the performance standards used in assessing the reliability of the interconnected system. These Reliability Criteria require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. The WSCC Reliability Criteria include the Reliability Criteria for Transmission System Planning, Power Supply Design Criteria, and Minimum Operating Reliability Criteria. Analysis of the WSCC system is based to a large degree on WSCC Section 4 “Criteria for Transmission System Contingency Performance” which requires that the results of power flow and stability simulations verify established performance levels. Performance levels are defined by specifying the allowable variations in voltage, frequency and loading that may occur on systems other than the one in which a disturbance originated. Levels of performance range from no significant adverse effect outside a system area during a minor disturbance (loss of load or facility loading outside emergency limits) to a performance level that only seeks to prevent system cascading and the subsequent blackout of islanded areas. While controlled loss of generation, load, or system separation is permitted in extreme circumstances, their uncontrolled loss is not permitted (WSCC 1998).
- North American Electric Reliability Council (NERC) Planning Standards provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC’s Criteria for Transmission System Contingency Performance. The NERC planning standards provide for acceptable system performance under normal and contingency conditions. The NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1998).
- Cal-ISO’s Reliability Criteria also provide policies, standards, principles, and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC’s Criteria for Transmission System Contingency Performance and the NERC Planning Standards. The Cal-ISO Reliability Criteria incorporate the WSCC Criteria and NERC Planning Standards. However, the Cal-ISO Reliability Criteria also provide some additional requirements that are not found in the WSCC Criteria or the NERC Planning Standards. The Cal-ISO Reliability Criteria apply to all existing and proposed facilities interconnecting to the Cal-ISO controlled grid. It also applies when there are any impacts to the Cal-ISO grid due to facilities interconnecting to adjacent controlled grids not operated by the Cal-ISO.

## **PROJECT DESCRIPTION**

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The REP project would be located on a 12-acre site. The fenced power plant area would encompass 9.1 acres, within the limits of the City of Roseville, adjacent to and north of the Pleasant Grove Waste Water Treatment Plant. The generating facility would consist of two combustion turbines (CTG), each with an output of 43 to 47 MW (see Definition of Terms), one condensing steam turbine (STG) with an output of 30 MW, peak-fire using duct burners to 75 to 87 MW, and two heat recovery steam generators (HRSG) providing a nominal total generating capacity of 120 to 125 MW and with peak-fire to 160 MW (Roseville 2003a, pages 1-5, 2-1, 2-2, Figure 2.2-4). Full-scale commercial operation is expected by summer of 2006.

### **POWER PLANT SWITCHYARD**

The project contains two combustion turbine generators and one steam turbine generator. Each of the CTGs and the STG generate power at 13.8 kV, and each generator is connected to the plant 60 kV switchyard using its own dedicated 13.8/60 kV step-up transformer. The switchyard would consist of SF6 insulated circuit breakers and manually operated disconnect switches on each side of each breaker. A breaker-and-half bus arrangement would be used in the switchyard to obtain a high level of service reliability (Roseville 2003a Figure 6.1-2 and page 10D-1). Staff concludes that these facilities are acceptable.

### **TRANSMISSION LINE**

The outlet transmission line would consist of a 100 foot long new double-circuit 60 kV transmission line, from the proposed REP on-site switchyard to the proposed West Roseville Specific Plan (WRSP) 60 kV double-circuit line which would extend to the existing Fiddymont substation. The 60 kV outlet transmission line is proposed to be carried on double-circuit single-pole wood structures. Each of the circuits would be 666.6 ACSS high temperature conductor with a normal summer rating of 125 megavolt amperes (MVA) and an emergency rating of 145 MVA (Roseville 2003a, page 6-1 and CH2MHill 2004a, page 4). As indicated in AFC Figure 6.1.2, a future line addition as part of the WRSP will connect a 60 kV double circuit transmission line from the WRSP substation to the REP switchyard. This configuration for the interconnection is in accordance with good utility practices and is considered acceptable.

### **EXISTING FACILITIES AND RELATED SYSTEMS**

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The City of Roseville recently approved the West Roseville Specific Plan. The WRSP includes construction of a new 60 kV double circuit transmission line that runs from the existing Fiddymont Receiving Station to a new WRSP substation along Phillip Road and passes adjacent to the REP. Power generated by the REP would be transmitted to the grid by looping two circuits of the WRSP transmission line into the REP switchyard. Construction of the new WRSP transmission lines is expected to be completed prior to interconnection of the REP project (Roseville 2003a page 1-7 and page 2-12).

## ANALYSIS

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### SYSTEM RELIABILITY

#### Introduction

For interconnecting proposed facilities to the grid, a System Impact Study and a Detailed Facility Study (DFS) are generally performed to determine the alternate and preferred interconnection methods. The studies also determine the downstream transmission system impacts, and the mitigation measures needed to conform with the system performance levels required by utility reliability criteria, NERC planning standards, WSCC reliability criteria, and Cal-ISO reliability criteria. The studies determine both positive and negative impacts and for the reliability criteria violations, determine the alternate and preferred additional transmission facilities or other mitigation measures. The studies are conducted with and without the new generation project and its interconnection facilities by using the computer model base case for the year the generator project would come on-line. The studies normally include a Load Flow study, Transient Stability study, Post-transient Load Flow study, and Short Circuit study. The studies are focused on thermal overloads, voltage deviations, system stability (excessive oscillations in generators and transmission system, voltage collapse, loss of loads or cascading outages), and short circuit duties. The studies must be conducted under the normal condition (N-0) of the system and also for all credible contingency/emergency conditions, which includes the loss of a single system element (N-1) such as a transmission line, transformer, or a generator and the simultaneous loss of two system elements (N-2), such as two transmission lines or a transmission line and a generator. In addition to the above analysis, the studies may be performed to verify whether sufficient active or reactive power is available in the area system or area sub-system to which the new generator project would be interconnected.

Any new transmission facilities, such as a power plant switchyard, the outlet line, and downstream facilities required for connecting a project to the grid, are considered part of the project.

New or modified downstream facilities that are a reasonably foreseeable consequence of approval of the project are analyzed but are not licensed by the Commission.

#### Scope of Detailed Facility Study

The transmission system was analyzed under the following system conditions:

- 2006 heavy summer base case with heavy load conditions in the greater Sacramento valley region.
- 2006 heavy summer case with the NCA Roseville CT generating unit at 50 MW.
- 2006 spring base case without the 50 MW NCPA Roseville CT

The study included Load Flow analysis, PV analysis, Dynamic Stability Studies, and Short Circuit studies.

## **Detailed Facility Study Summary**

### **Power Flow Study Results**

The Power Flow Study results indicate that interconnection of the REP causes no normal overloads in either the Heavy Summer or Light Spring analysis.

Contingency study of the 2006 heavy summer case indicated an improvement in transmission system performance with the addition of the REP. Before addition of the REP, the N-1 contingency study indicated 26 elements were overloaded. With the addition of the REP, only four overloaded elements remained. The loading of the 22 pre-existing overloaded elements dropped to within their ratings (CH2MHill 2004a, page 4).

The overloaded elements under N-1 contingencies include (CH2MHill 2004a, Table I):

<b>Overloaded Facilities Under N-1 Contingency Summer Case (Without Roseville CT)</b>	<b>Percentage Loading of the Facility</b>		<b>Percentage Increment in Loading</b>	<b>SELECTED MITIGATION</b>
	<b>Pre-REP</b>	<b>Post-REP</b>		
Hurley S 230 kV – Carmichael 230 kV circuit #1	109	113	4	Cal-ISO / SVSG T-121 Operating Procedures
Hurley S 230 kV – Natomas 230 kV circuit #1	108	109	1	
Tracy PMP 230 kV – Tesla D 230 kV circuit #1	108	110	2	
Tracy PMP 230 kV – Tesla D 230 kV circuit #2	108	110	2	
ElvertaW 230 kV – Hurley S 230 kV circuit #1	95	107	12	Western will re-rate these lines. If the re-rating is feasible, the emergency ratings will be increased.
ElvertaW 230 kV – Hurley S 230 kV circuit #2	89	100	11	
REP60 60 kV – Fiddymment 60 kV #1	NA	110	10	Install a Remedial Action Scheme to reduce the REP output. The future WRSP transmission system addition will eliminate the overloads.
REP60 60 kV – Fiddymment 60 kV #2	NA	110	10	



The overloaded element under an N-2 contingency is the loss of the Elverta - Hurley line #1 and #2.

<b>Overloaded Facility Under N-2 Contingency Summer Case (Without Roseville CT)</b>	<b>Percentage Loading of the Facility</b>		<b>Percentage Increment in Loading</b>	<b>SELECTED MITIGATION</b>
	<b>Pre-REP</b>	<b>Post-REP</b>		
ElvertaS – ElvertaW 230 kV circuit #1	98	110	12	Cal-ISO / SVSG T-121 Operating Procedures

A Sensitivity study indicated that with NCPA's Roseville CT generating at 50 MW and with the REP, the REP would have minimal effect on the City's 60 kV and 230 kV transmission systems. The overloads under contingency conditions that appear in the 230 kV transmission system and are as follows (CH2MHill 2004a page 8).

<b>Overloaded Facility Under N-1 Contingency Summer Case (with Roseville CT)</b>	<b>Percentage Loading of the Facility</b>		<b>Percentage Increment in Loading</b>	<b>SELECTED MITIGATION</b>
	<b>Pre-REP</b>	<b>Post-REP</b>		
Hurley S 230 kV – Carmichael 230 kV circuit #1	109	113	4	Cal-ISO / SVSG T-121 Operating Procedures
Hurley S 230 kV – Natomas 230 kV circuit #1	108	109	1	
Tracy PMP 230 kV – Tesla D 230 kV circuit #1	108	113	5	
Tracy PMP 230 kV – Tesla D 230 kV circuit #2	108	113	5	
ElvertaW 230 kV – Hurley S 230 kV circuit #1	95	110	15	Western will re-rate these lines. If the re-rating is feasible, the emergency ratings will be increased.
ElvertaW 230 kV – Hurley S 230 kV circuit #2	89	103	14	
REP60 60 kV – Fiddymment 60 kV #1	NA	110	10	Install a Remedial Action Scheme (RAS) to reduce the REP output. The future WRSP transmission system addition will eliminate the overloads.
REP60 60 kV – Fiddymment 60 kV #2	NA	110	10	

The Power Flow analysis for the spring case indicates that interconnection of the REP would not cause any criteria violations in the transmission facilities. Under an N-1 contingency, the overloaded elements are as follows:

<b>Overloaded Facility Under N-1 Contingency Spring Case (Without Roseville CT)</b>	<b>Percentage Loading of the Facility</b>		<b>Percentage Increment in Loading</b>	<b>SELECTED MITIGATION</b>
	<b>Pre-REP</b>	<b>Post-REP</b>		
REP60 60 kV – Fiddymment 60 kV #1	NA	110	10	Install a RAS to reduce the REP output. The future WRSP transmission system addition will eliminate the overloads.
REP60 60 kV – Fiddymment 60 kV #2	NA	110	10	

### **Mitigation Measures**

As mentioned above, the selected mitigation measures for the contingency overload would be to implement the Cal-ISO / SVSG T-121 Operating Procedures, re-rate lines, install a RAS to reduce the REP output, and a future WRSP transmission system addition. The T-121 Operating Procedures (WAPA 2004a) includes:

- reduce generation north of Elverta;
- increase generation internal to SMUD; and
- reduce/shed load

Western is in the process of re-rating the Elverta-Hurley lines and working with SMUD to assure an adequate rating. The WRSP will expand Roseville Electric's transmission infrastructure. A double circuit 60 kV transmission line will connect the REP switchyard to the WRSP substation. The future expansion will eliminate the contingency overload of the REP – Fiddymment line and improve reliability and security. This transmission expansion is independent of the REP.

### **PV Analysis Results**

The PV analysis confirms no voltage criteria violation occurs after adding the REP. Addition of the REP to the transmission grid will improve the Sacramento area import capability and improve local area voltage support (CH2MHill 2004a, page 7). The provision of dynamic voltage support in the area and improved import capability is considered by staff a local system benefit.

### **Dynamic Stability Study Results**

Dynamic stability studies were previously conducted for year 2002 using a larger plant, the Roseville Energy Facility (900 MW), in the same general location to determine if it would create any instability and adverse impact on the stable operation of the transmission grid following selected disturbances (CH2MHill 2004a, page 8 & 9). The results indicate there are no transient stability concerns on the transmission system following the selected disturbances for integration of the once proposed 900 MW

Roseville Energy Facility. Thus, it is also concluded that the REP would not create any adverse impact to the transmission grid since the REP would produce a much smaller output.

### **Short Circuit Study Results**

The short circuit studies were conducted to determine whether the REP project would result in overstressing the existing fault interruption rating of circuit breakers. The DFS showed that all of the existing circuit breakers are capable of handling the increase in fault level with the addition of the REP (CH2MHill 2004a, page 10).

### **SYSTEM BENEFIT**

The addition of the REP project would alleviate 22 out of 26 of the pre-project existing overloads occurring under contingency conditions. The REP also improves transmission grid voltages and area import capability. The REP significantly improves the reliability performance of the Roseville Electric transmission system and its ability to meet the NERC planning standards and WSCC reliability criteria. The addition of the REP also reduces import requirements by providing local generation.

### **CUMULATIVE IMPACTS**

Since the REP project would be located in the load center of Roseville Electric's transmission system, and all the proposed facilities will be located within the proposed fence lines, the project will minimize potential cumulative impacts.

## **TRANSMISSION ALTERNATIVES**

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### **TRANSMISSION LINE ROUTE ALTERNATIVES**

The WRSP was approved by the City of Roseville. In the AFC (Roseville 2003a, page 6-1) and Supplement in Response to Data Adequacy Comments (Roseville 2003b, page S-6), the REP project would loop the new WRSP 60 kV double circuit lines into the REP switchyard. Because the project would loop the WRSP alternative terminations were not considered. Staff concludes this configuration is acceptable.

## **FACILITY CLOSURE**

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### **PLANNED CLOSURE**

Planned closure occurs in a planned and orderly manner such as at the end of its useful economic or mechanical life or due to gradual obsolescence. Under such circumstances, the owner is required to provide a closure plan 12 months prior to closure, which in conjunction with applicable LORS, is considered sufficient to provide adequate safety and reliability. For instance, a planned closure provides time for the owner to coordinate with the Transmission Owner (TO) to assure (as one example) that the TO's system would not be closed into the outlet thus energizing the project substation. Alternatively, the owner may coordinate with the transmission owner to

maintain some power service via the outlet line to supply critical station service equipment or other loads.<sup>1</sup>

## UNEXPECTED TEMPORARY CLOSURE

Unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly for a short term due to unforeseen circumstances such as a natural or other disaster or emergency. During such a closure the facility cannot insert power into the utility system. Closures of this sort can be accommodated by establishing an on-site contingency plan (see **General Conditions Including Compliance Monitoring and Closure Plan**).

## UNEXPECTED PERMANENT CLOSURE

Unexpected permanent closure occurs when the project owner abandons the facility. This is considered to be a permanent closure. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. An on-site contingency plan, that is in place and approved by the Energy Commission's Compliance Project Manager (CPM) prior to the beginning of commercial operation of the facilities, would be developed to assure safety and reliability (see **General Conditions Including Compliance Monitoring and Closure Plan**).

## CONCLUSIONS AND RECOMMENDATIONS

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Staff concludes as follows:

- Addition of the REP does not cause any negative impacts on the PG&E transmission system which is part of the Cal-ISO transmission system.
- The REP does not cause any normal condition overloads to the transmission grid. Under contingency conditions, the REP project helps alleviate 22 out of 26 existing, pre project overloads. The remaining overloads would be mitigated by rerating conductors, planned future transmission expansion and operational procedures.
- The REP switchyard and interconnection facilities to the transmission grid via a 60 kV line through the REP switchyard will be adequate and reliable. The power plant switchyard, outlet lines, and terminations are in accordance with good utility practices and are acceptable. Staff concludes that these facilities will comply with LORS, assuming the conditions of certification are met.
- Adding local generation such as the REP would improve local area voltage support and improves import capability. Adding the REP would not cause stability criteria violations.
- The existing circuit breakers are capable of handling the increase in fault level with the addition of the REP.

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<sup>1</sup> These are merely examples, many more exist.

## CONDITIONS OF CERTIFICATION FOR TSE

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**TSE-1** The project owner shall ensure that the design, construction and operation of the proposed transmission facilities shall conform to all applicable LORS including the requirements 1a) through 1j) listed below.

- a) The project shall connect to the WRSP 60 kV double circuit lines of the Roseville Electric transmission system using about 100 foot of 60 kV double circuit transmission line. Interconnection will be executed through the power plant 60 kV switchyard located at the REP project site.
- b) The project 60 kV switchyard shall have a breaker and a half configuration.
- c) The project conductors shall be sized to accommodate the full output from the project.
- d) The power plant switchyard, outlet line and termination shall meet or exceed the electrical, mechanical, civil and structural requirements of CPUC General Order 95 or National Electric Safety Code (NESC), Title 8 of the California Code and Regulations (Title 8), Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", National Electric Code (NEC) and related industry standards.
- e) Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.
- f) Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner's standards.
- g) Termination facilities to the Roseville 60 kV line shall comply with applicable Roseville Electric interconnection standards.
- h) The project owner shall provide to the CPM:
  - i) The final Detailed Facility Study (DFS), if modified, including a description of new facilities, facility upgrades, operational mitigation measures, and/or Special Protection System (SPS) sequencing and timing if applicable,
  - j) A letter from transmission owner(s) stating that the mitigation measures or projects for each criteria violation selected by the project owner are acceptable.

**Verification:** At least 60 days prior to the start of grading of the power plant switchyard or transmission facilities, the project owner shall submit to the CPM for approval:

Electrical one line diagrams signed and sealed by a registered professional electrical engineer in responsible charge (or other approval acceptable to the CPM), a route map, and an engineering description of equipment and the configurations covered by the requirements 1a) through 1j) above.

The Detailed Facilities Study (if modified) including a description of facility upgrades, operational mitigation measures and/or RAS or SPS. Substitution of equipment and

substation configurations shall be identified and justified by the project owner for CPM approval.

**TSE-2** The project owner shall provide the following Notice to the California Independent System Operator (Cal-ISO) prior to synchronizing the facility with the California Transmission system:

1. At least one week prior to synchronizing the facility with the grid for testing, provide the Cal-ISO a letter stating the proposed date of synchronization; and
2. At least one business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the ISO Outage Coordination Department.

**Verification:** The project owner shall provide copies of the Cal-ISO letter to the CPM when it is sent to the Cal-ISO one week prior to initial synchronization with the grid. The project owner shall contact the Cal-ISO Outage Coordination Department, Monday through Friday, between the hours of 0700 and 1530 at (916) 351-2300 at least one business day prior to synchronizing the facility with the grid for testing. A report of conversation with the Cal-ISO shall be provided electronically to the CPM one day before synchronizing the facility with the California transmission system for the first time.

**TSE-3** The project owner shall inform the CPM of any impending changes that may not conform to the requirements 1a) through 1j) of **TSE-1**, and have not received CPM approval, and request approval to implement such changes. Construction involving changed equipment or substation configurations shall not begin without prior written approval of the changes by the CPM.

**Verification:** At least 60 days prior to the construction of the power plant switchyard and transmission facilities, the project owner shall inform the CPM of any impending changes that may not conform to requirements 1a) through 1j) of **TSE-1** and request approval to implement such changes.

**TSE-4** The project owner shall be responsible for the inspection of the transmission facilities during project construction, and any subsequent CPM approved changes thereto, to ensure conformance with CPUC GO-95 or NESC, CPUC GO-128, Title 8 of the California Code of Regulations, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", NEC, related industry standards and these conditions. In case of non-conformance, the project owner shall inform the CPM in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

**Verification:** Within 60 days after first synchronization of the project to the grid, the project owner shall transmit to the CPM an engineering description(s) and one-line diagrams of the "as built" facilities greater than 18 kV signed and sealed by the registered electrical engineer in responsible charge (or other verification acceptable to the CPM, such as a letter stating that the attached diagrams have been verified by the engineer). A statement, signed and sealed, attesting to conformance with CPUC GO-95 or NESC, CPUC GO-128, Title 8 of the California Code of Regulations, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", NEC, related industry standards and these conditions shall be provided concurrently.

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Western Area Power Administration (WAPA) 2004a. Responses to CEC questions regarding the Screening Study dated June 24, 2003. Submitted to the Docket on March 4, 2004.

WSCC (Western Systems Coordinating Council) 1997. Reliability Criteria, August 1998.

## DEFINITION OF TERMS

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AAC            All Aluminum conductor.

Ampacity      Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations.

Ampere        The unit of current flowing in a conductor.

Bundled        Two wires, 18 inches apart.

Bus            Conductors that serve as a common connection for two or more circuits.

Conductor     The part of the transmission line (the wire) which carries the current.

Congestion Management

Congestion management is a scheduling protocol, which provides that dispatched generation and transmission loading (imports), would not violate criteria.

Emergency Overload

See Single Contingency. This is also called an L-1.

Kcmil or kcm

Thousand circular mil. A unit of the conductor's cross sectional area, when divided by 1,273, the area in square inches is obtained.

**Kilovolt (kV)**

A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground.

**Loop**

An electrical cul de sac. A transmission configuration which interrupts an existing circuit, diverts it to another connection and returns it back to the interrupted circuit, thus forming a loop or cul de sac.

**Megavar**

One megavolt ampere reactive.

**Megavars**

Mega-volt-Ampere-Reactive. One million Volt-Ampere-Reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.

**Megavolt ampere (MVA)**

A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.

**Megawatt (MW)**

A unit of power equivalent to 1,341 horsepower.

**Multiple Contingencies**

A condition that occurs when more than one major transmission element (circuit, transformer, circuit breaker, etc.) or more than one generator is out of service

**Normal Operation/ Normal Overload**

When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.

**N-1 Condition**

See Single Contingency.

**Outlet**

Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities to the main grid.

**Power Flow Analysis**

A power flow analysis is a forward looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers and other equipment and system voltage levels.

**Reactive Power**

Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate



supply of reactive power is required to maintain voltage levels in the system.

**Remedial Action Scheme (RAS)**

A remedial action scheme is an automatic control provision, which, for instance, would trip a selected generating unit upon a circuit overload.

**SF6**

Sulfur hexafluoride is an insulating medium.

**Single Contingency**

Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service.

**Solid dielectric cable**

Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.

**System Protection System**

See Remedial Action Scheme.

**Switchyard**

A power plant switchyard (switchyard) is an integral part of a power plant and is used as an outlet for one or more electric generators.

**Thermal rating**

See ampacity.

**TSE**

Transmission System Engineering.

**Undercrossing**

A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.

**Underbuild**

A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

# ALTERNATIVES

Bob Eller

## INTRODUCTION

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This section considers potential alternatives to the construction and operation of Roseville Electric's (RE) proposed Roseville Energy Park (REP) project. The purpose of this alternatives analysis is to comply with California's environmental laws by providing an analysis of a reasonable range of feasible alternatives that could reduce or avoid any potentially significant adverse impacts of the proposed project (Cal. Code Regs., tit. 14, §15126.6; Cal. Code Regs., tit. 20, §1765). In this Alternatives analysis, staff has analyzed different technologies and alternative sites that may reduce or avoid the identified significant impacts.

The purpose of staff's alternatives analysis is to provide a reasonable range of feasible alternatives that could substantially reduce or avoid any potentially significant adverse impacts of the proposed project. To accomplish this, staff must determine the appropriate scope of analysis. Consequently, it is necessary to identify and determine the potentially significant impacts of the proposed project and then focus on alternatives that are capable of reducing or avoiding the significant impacts of the proposed project. To prepare this analysis, staff:

- identified the basic objectives of the project, provided an overview of the project, and described its potentially significant adverse impacts;
- identified and evaluated alternative sites (whether the alternative site mitigates the identified impacts of the proposed project and whether the alternative site creates impacts of its own);
- identified and evaluated technology alternatives to the project, including conservation and other renewable sources; and
- evaluated the impacts of not constructing the project, known as the No Project Alternative under CEQA.

## LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

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The "Guidelines for Implementation of the California Environmental Quality Act," Title 14, California Code of Regulations Section 15126.6(a), provide direction by requiring an evaluation of the comparative merits of "a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project." In addition, the analysis must address the No Project Alternative (Cal. Code Regs., tit. 14, §15126.6(e)).

The range of alternatives is governed by the "rule of reason" which requires consideration only of those alternatives necessary to permit informed decision-making and public participation. The California Environmental Quality Act (CEQA) states that an environmental document does not have to consider an alternative if its effect cannot be reasonably ascertained and if its implementation is remote and speculative (Cal.

Code Regs., tit. 14, §15125(d)(5)). However, if the range of alternatives is defined too narrowly, the analysis may be inadequate (*City of Santee v. County of San Diego* (4th Dist. 1989) 214 Cal. App. 3d 1438).

## **SITE SELECTION AND PROJECT OBJECTIVES**

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In choosing the proposed site the applicant used the site selection criteria listed below. According to the AFC, the applicant used the following criteria in choosing the proposed site (Roseville 2003a). Staff believes these criteria are appropriate for a screening level analysis of site alternatives. Roseville Electric's primary criteria for site selection and project objectives were:

- to improve the quality and reliability of electric service in Roseville by locating the plant within RE's service area, directly connected to the Roseville Electric distribution grid;
- to provide rate stability and reasonable cost to ratepayers by decreasing the City's dependence on short-term and long-term external power contracts;
- to gain better control over operational issues that may stem from transmission facilities in the Sacramento Valley region that experience congestion during peak periods;
- To locate generation in or near load centers so as to increase overall grid reliability; and
- To minimize environmental impacts from the power plant site itself as well as from the gas, water and transmission lines.

## **ANALYSIS OF ALTERNATIVE SITES**

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### **PROPOSED SITE**

The REP would be located on a 12-acre site that lies within a 40-acre City of Roseville parcel. The project site is within the limits of the City of Roseville, adjacent to and north of the Pleasant Grove Waste Water Treatment Plant (PGWWTP). The project site is owned by the City of Roseville and is zoned Public/Quasi-Public. Surrounding land uses currently include ranching (agricultural grazing) and rural residential. The project area to the south, east, and west, however, is proposed for residential, industrial, and commercial development under the West Roseville Specific Plan (WRSP). The WRSP is a plan for annexation and development of 3,162 acres and was approved by the City Council in February, 2004. Build-out of the WRSP will take place over approximately 10 years.

### **ALTERNATIVE SITES**

RE identified and assessed the suitability of several other sites for the REP. As part of this assessment, sites that were less than eight acres in size were eliminated from further consideration because of their inability to support the project's space requirements.

Four potential sites that have sufficient land available were identified by the applicant. **Alternatives Figure 1** show the location of the alternative sites that are potentially suitable for construction of REP.

### **Alternative Site Selection Criteria**

For comparison purposes, and to meet the requirements of CEQA and Title 20, alternative sites were chosen by the applicant that could feasibly attain most of the project's basic objectives.

The key siting criteria in considering these alternatives and the proposal REP site included the following factors:

- location more than 1,000 feet from the nearest residential uses or other sensitive receptor;
- location near the centers of demand for maximum efficiency and system benefit;
- land zoned for industrial use or heavy industry;
- access to tertiary treated waste water from the Dry Creek or Pleasant Grove Waste Water Treatment Plant for cooling water;
- location near electrical transmission facilities;
- location near reliable natural gas supply;
- a parcel or adjoining parcels of sufficient size for a power plant and construction laydown areas;
- feasible site control (lease or ownership);
- minimize construction impacts to existing residences and businesses;
- feasible mitigation of potential environmental impacts.

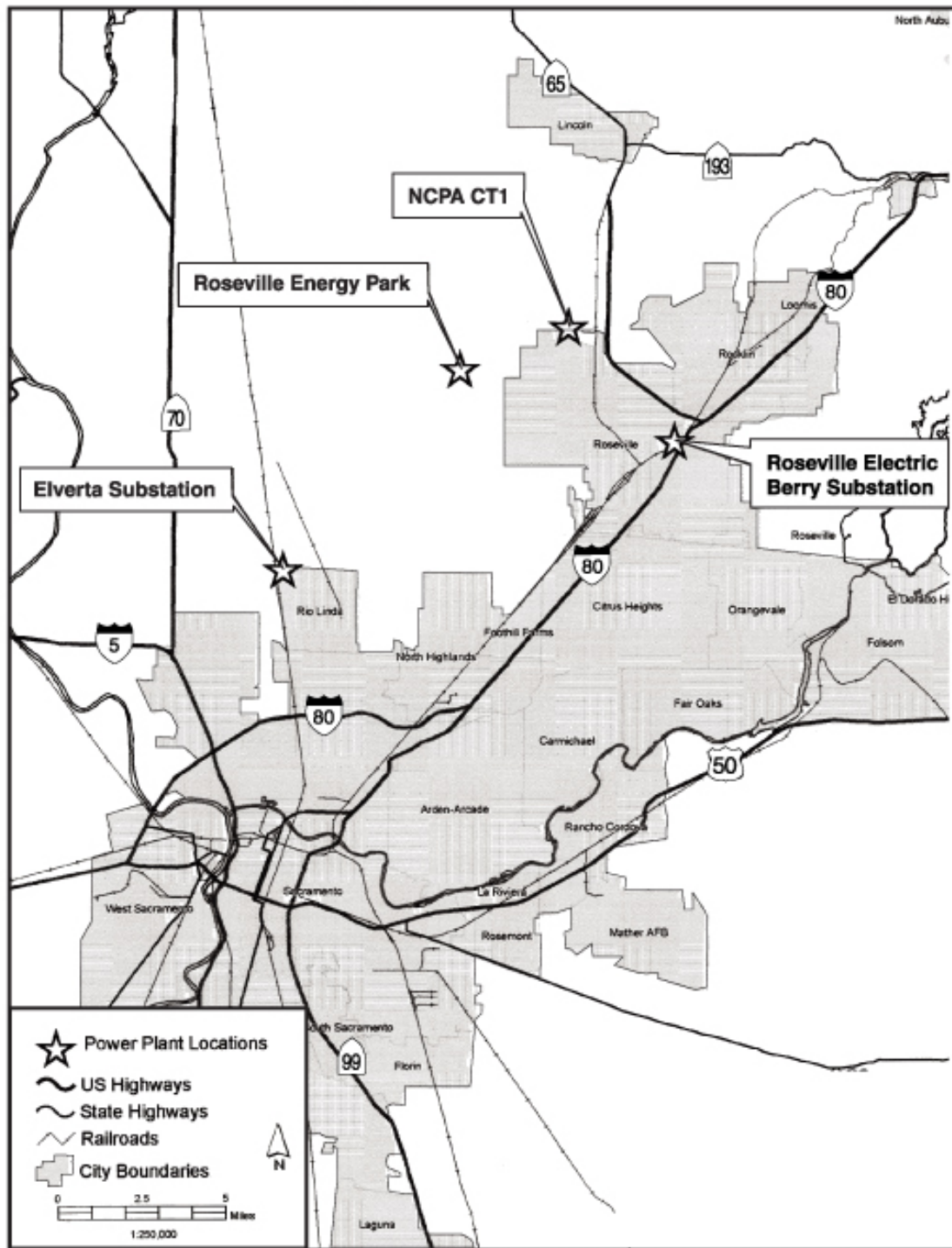
### **Alternative Site Description**

#### **Proposed Roseville Energy Park Site**

The proposed site for the REP on Phillip Road in Roseville, California met all of the project objectives identified by RE. According to RE this site was chosen because it is:

- located adjacent to a source of reclaimed waste water sufficient for plant cooling (the PGWWTP) such that a lengthy pipeline would not be necessary, thus reducing environmental effects;
- located near transmission facilities, the new 60 kV transmission line that will serve West Roseville, making it unnecessary to construct new transmission facilities, thus reducing environmental effects;

**ALTERNATIVES - Figure 1**  
**Roseville Energy Park - Alternative Power Plant Locations**



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2004  
 SOURCE: Roseville Energy Park AFC, Figure 9.3-1

JUNE 2004

ALTERNATIVES

- zoned Public/Quasi-Public, which includes power generation as a permitted use;
- located 1.2 miles from the nearest residential area and 3 miles from sensitive receptors and, in combination with the West Roseville Specific Plan Area build-out, is located more than 1,000 feet from the nearest residential use or sensitive receptor;
- located where construction impacts to existing residences and businesses will be minimal; and
- the project site is owned by the City of Roseville and includes ample area for site construction, laydown, and staging.

### **Roseville Electric Berry Substation**

The Roseville Electric Berry Substation site is located within a 25-acre parcel adjacent to Berry Road and Galleria Boulevard. The site is currently owned by the City of Roseville and is adjacent to RE's Berry Substation. Transmission lines are available from the Berry substation immediately to the south of the site. The site is currently vacant. Residential and commercial and industrial uses surround the site.

The site is zoned properly for electric generation but has existing residences approximately 500 feet to the west of the site. The site would have additional visual impacts since it is visible to several major transportation corridors, including interstate 80. Unlike the proposed site there have been no wetlands identified at this site. However, the site may provide limited foraging habitat for burrowing owls.

Staff agrees with the applicant that this site would require greater visual and noise mitigation than the proposed REP.

### **Elverta Substation**

The Elverta Substation site is located on 90 acres in Elverta in northwestern Sacramento County. The site is west of the junction of U Street and Marysville Boulevard, just south of the Western Area Power Administration's Elverta Substation. The site is currently used for grazing. A rural residential area is located east and south of the site. Agricultural uses are to the west.

Unlike the proposed REP site and the Berry substation site, Roseville Electric does not have site control for this proposed alternative. The Elverta Substation site, zoned for industrial use, is approximately 700 feet from the nearest residence and contains wetlands. This would result in impacts to protected species similar to the potential impacts identified at the proposed REP site. The site is the only proposed alternative that would not have access to recycled water.

Staff agrees with the applicant that this site would have similar biological impacts as the proposed site but would have additional impacts to water resources since recycled water is not available at this site.

## **NCPA CT-1**

The NCPA CT-1 site is located just north of the Roseville City limits in Placer County. The site is just north of the existing Northern California Power Authority Combustion Turbine facility NCPA CT-1 in an open area between newer housing developments to the west and an industrial area to the east. A housing development is under construction immediately south of the site.

Unlike the proposed REP site and the Berry substation site, Roseville Electric does not have site control for this proposed alternative. Residences are currently located approximately 500 feet from this site. The site is currently zoned for farming and, as a result, use of this proposed site would require the conversion of existing agricultural lands. According to the applicant, the site may contain wetlands and provides habitat for the burrowing owl and other foraging raptors.

Staff agrees with the applicant that this alternative will require additional noise mitigation to alleviate impacts to adjacent residences, has similar potential impacts to biological resources to those at the REP site, and would result in the conversion of existing farmlands.

## **Conclusion Regarding Alternative Sites**

Staff has evaluated the alternative sites proposed by the applicant and finds that the alternative sites would have similar impacts to those identified at the proposed site and, in some cases, additional impacts due to the proximity of residences or an increased length of linear facilities.

Staff believes that, if the mitigation identified by staff in this PSA is implemented, the impacts of the construction and operation of the REP, at the proposed site, can be mitigated to an insignificant level for most technical areas. Some of this additional mitigation will require discussion with the applicant during our PSA workshops. In the event staff cannot reach agreement with the applicant on the proposed mitigation we will provide additional alternative sites for evaluation in the Final Staff Assessment (FSA).

## **NO PROJECT ALTERNATIVE**

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The No Project Alternative under CEQA assumes that the REP project is not constructed. In the CEQA analysis, the No Project Alternative is compared to the proposed project and determined to be superior, equivalent, or inferior to it. The CEQA Guidelines state that “the purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project” (Cal. Code Regs., tit. §15126.6(i)). Toward that end, the No Project analysis considers “existing conditions” and “what would be reasonably expected to occur in the foreseeable future if the project were not approved...” (§15126.6(e)(2)).

If the REP facility was not constructed, the proposed site, adjacent to the recently approved West Roseville Specific Plan (WRSP) area and the Pleasant Grove Waste

Water Treatment Plant would likely be developed for some other industrial use. However, if the REP was not constructed, it would not contribute to Roseville Electric and California's electricity resources, increase competition, and help form a more reliable electric system.

## **ALTERNATIVES ELIMINATED FROM DETAILED ANALYSIS**

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This section describes alternatives that did not satisfy the screening criteria for inclusion in a more detailed analysis, and include the following:

- simple or combined-cycle gas-fired plant
- demand side management;
- distributed generation; and
- other renewable resources.

These alternatives, and the reasons for their not being considered in detail in this analysis, are addressed below.

## **TECHNOLOGY ALTERNATIVES**

### **Conservation and Demand-Side Management**

Conservation and demand-side management (DSM) include a variety of approaches, including energy efficiency and conservation, building and appliance standards, load management and fuel substitution. Public Resources Code Section 25305(c) states that conservation, load management, or other demand reducing measures reasonably expected to occur shall be explicitly examined in the Energy Commission's energy forecasts and shall not be considered as alternatives to a proposed facility during the siting process. The forecast that addresses this issue is the Energy Commission's Integrated Energy Policy Report. Thus, such alternatives are not included in this analysis.

## **GENERATION TECHNOLOGY ALTERNATIVES**

Staff considered several alternative generation technologies including solar, wind, biomass, and hydropower.

### **Solar Generation**

There are two types of solar generation: solar thermal power and photovoltaic (PV) power generation.

Solar thermal power generation involves the conversion of solar radiation to thermal energy, which is then used to run a conventional steam power system. Solar thermal is a viable alternative to conventional generation systems and, depending on the technology, is suited to either distributed generation on the kW scale or to centralized power generation on scales up to several hundred MW. Solar thermal systems utilize three designs to generate electricity: parabolic trough concentrating collectors, power tower/heliostat configurations, and parabolic dish collectors. Parabolic trough and



power tower systems typically run conventional power units, such as steam turbines, while parabolic dish systems power a small engine at the focal point of the collector.

PV power generation involves the direct conversion of light to electricity. PV is best suited to distributed generation uses rather than centralized power generation. PV is the most capital intensive of any alternative generation technology (Aspen 2001). PV power systems consist of solar electric modules (built from PV cells) assembled into arrays of varying sizes to produce electric power proportional to the area of the array and the intensity of the sunlight. PV arrays can be mounted on either the ground or on buildings. They can be installed on dual-purpose structures such as covered parking lots.

Solar resources would require large land areas in order to generate 160 MW of electricity. Specifically, assuming location in an area receiving maximum solar exposure such as the desert areas of California, central receiver solar thermal projects require approximately five acres per MW, so 160 MW would require approximately 800 acres. One square kilometer of PV generation (400 acres) can produce 100 MW of power, so 160 MW would require approximately 640 acres. Either of these technologies would use significantly more land area than the 12 acres required for the proposed REP.

Although air emissions are significantly reduced or eliminated for solar facilities, these facilities can have significant visual effects. Solar generation results in the absence or reduction in air pollutant emissions, and visible plumes. Water consumption for solar generation is substantially less than for a geothermal or natural gas fired plant because there is no thermal cooling requirement. In addition, the large avian populations, migratory bird pathways, and relatively large populations of threatened or endangered birds in an area would require careful analysis of potential impacts from either solar or PV generation at scale.

Like all technologies generating power for sale into the state's power grid, solar thermal facilities and PV generation require near access to transmission lines. Large solar thermal plants must be located in desert areas with high direct normal insolation, and in these remote areas, transmission availability is limited. Additionally, solar energy technologies cannot provide full-time availability due to the natural intermittent availability of sunlight. Therefore, solar thermal power and photovoltaic power generation would not successfully meet the project objectives.

## **Wind Generation**

Wind carries kinetic energy that can be used to spin the blades of a wind turbine rotor and an electrical generator, which then feeds alternating current into the utility grid. Most state-of-the-art wind turbines operating today convert 35 to 40 percent of the wind's kinetic energy into electricity. Modern wind turbines represent viable alternatives to large bulk power fossil power plants as well as small-scale distributed systems. The range of capacity for an individual wind turbine today ranges from 400 watts up to 3.6 MW. California's 1,700 MW of wind power represents 1.5 percent of the state's electrical capacity (Aspen 2001).

Although air emissions are significantly reduced or eliminated for wind facilities, these facilities can have significant visual effects. Wind turbines have also caused bird mortality (especially for raptors) resulting from collision with rotating blades although this effect is more noted in the Altamont Pass area than in other parts of the state.

Wind resources require large land areas in order to generate 250 MW of electricity. Depending on the size of the wind turbines, wind generation “farms” generally can require between 5 and 17 acres to generate one megawatt (CEC 2004a). A 160MW plant would therefore require between 800 and 1,820 acres. Although 7,000 MW of new power wind capacity could cost-effectively be added to California’s power supply, the lack of available transmission access is an important barrier to wind power development (Beck et al. 2001). California has a diversity of existing and potential wind resource regions that are near load centers such as San Francisco, Los Angeles, San Diego and Sacramento (CEC 2004b). However, wind energy technologies cannot provide full-time availability due to the natural intermittent availability of wind resources. Therefore, wind generation technology would not meet the project’s goal, which is to provide load-serving capacity.

### **Biomass Generation**

Biomass generation uses a waste vegetation fuel source such as wood chips (the preferred source) or agricultural waste. The fuel is burned to generate steam. Biomass facilities generate substantially greater quantities of air pollutant emissions than natural gas burning facilities. In addition, biomass plants are typically sized to generate less than 20 MW, which is substantially less than the capacity of the 160 MW REP project. At the peak of the biomass industry, 66 biomass plants were in operation in California, but as of 2001, only about 30 direct-combustion biomass facilities were in operation (CEC 2004c).

In order to generate 160 MW, ten 16 MW biomass facilities would be required. These power plants would have potentially significant environmental impacts of their own.

### **Hydropower**

While hydropower does not require burning fossil fuels and may be available in California, this power source can cause significant environmental impacts, due primarily to the inundation of many acres of potentially valuable habitat and the interference with fish movements during their life cycles. In addition, planning and permitting time is on the order of 10 years. As a result, it is extremely unlikely that new large hydropower facilities could be developed and permitted in California within the next several years (Aspen 2001).

### **Conclusion Regarding Alternative Technologies**

Alternative generation typically has specific resource needs, environmental impacts, permitting difficulties, and intermittent availability. Therefore, these technologies do not fulfill a basic objective of the proposed project to provide load-serving capability in order to ensure a reliable supply of electricity for Roseville Electric and California. Consequently, staff does not believe that these renewable technologies present feasible alternatives to the proposed project.

Staff notes that Roseville Electric's resource mix currently encompasses a substantial contribution from alternative resources. Roseville Electric, for the fiscal year ending June 30, 2002, had annual sales of over 928 million kilowatt hours (kWh) to their 36,373 residential and 4,506 commercial customers (Roseville 2004a). For the calendar year 2002, Roseville Electric's resource mix included renewable resources (16 percent), coal derived electricity (6 percent), large hydroelectric generation (41 percent), natural gas-fired generation (28 percent), and nuclear power (8 percent) (Roseville 2004b).

## CONCLUSIONS

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Staff does not consider alternative technologies (solar, wind, biomass, and hydroelectric) to be feasible alternatives to the proposed project. While the No Project Alternative would eliminate all impacts of this project, including the benefits of increasing in-state generation and increased capacity for Roseville Electric. This would ensure that environmental impacts could be shifted to other power plant locations where impacts might be greater than those that would result from the construction and operation of the REP.

Staff has evaluated the alternative sites proposed by the applicant and finds that the alternative sites would have similar impacts to those identified at the proposed site and, in some cases, additional impacts due to the proximity of residences or an increased length of linear facilities.

Staff believes that, if the mitigation identified by staff in this Preliminary Staff Assessment is implemented, the impacts of the construction and operation of the REP, at the proposed site, can be mitigated to an insignificant level. Some of this additional mitigation will require additional discussion with the applicant during our PSA workshops. In the event staff cannot reach agreement with the applicant on the proposed mitigation, we will provide additional alternative sites for evaluation in the Final Staff Assessment (FSA).

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# **GENERAL CONDITIONS INCLUDING COMPLIANCE MONITORING AND CLOSURE PLAN**

Donna Stone

## **INTRODUCTION**

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The project General Conditions Including Compliance Monitoring and Closure Plan (Compliance Plan) have been established as required by Public Resources Code section 25532. The plan provides a means for assuring that the facility is constructed, operated and closed in compliance with air and water quality, public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission (Energy Commission) and specified in the written decision on the Application for Certification or otherwise required by law.

The Compliance Plan is composed of elements that:

- set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
- set forth the requirements for handling confidential records and maintaining the compliance record;
- state procedures for settling disputes and making post-certification changes;
- state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission approved conditions;
- establish requirements for facility closure plans; and
- specify conditions of certification that follow each technical area that contain the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure to an insignificant level. Each specific condition of certification also includes a verification provision that describes the method of assuring that the condition has been satisfied.

## **DEFINITIONS**

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To ensure consistency, continuity and efficiency, the following terms, as defined, apply to all technical areas, including Conditions of Certification:

## **SITE MOBILIZATION**

Moving trailers and related equipment onto the site, usually accompanied by minor ground disturbance, grading for the trailers and limited vehicle parking, trenching for construction utilities, installing utilities, grading for an access corridor, and other related activities. Ground disturbance, grading, etc. for site mobilization are limited to the portion of the site necessary for placing the trailers and providing access and parking for the occupants. Site mobilization is for temporary facilities and is, therefore, not considered construction.

## **GROUND DISTURBANCE**

Onsite activity that results in the removal of soil or vegetation, boring, trenching or alteration of the site surface. This does not include driving or parking a passenger vehicle, pickup truck, or other light vehicle, or walking on the site.

## **GRADING**

Onsite activity conducted with earth-moving equipment that results in alteration of the topographical features of the site such as leveling, removal of hills or high spots, or moving of soil from one area to another.

## **CONSTRUCTION**

[From section 25105 of the Warren-Alquist Act.] Onsite work to install permanent equipment or structures for any facility. Construction does **not** include the following:

- a. the installation of environmental monitoring equipment;
- b. a soil or geological investigation;
- c. a topographical survey;
- d. any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility; or
- e. any work to provide access to the site for any of the purposes specified in a., b., c., or d.

## **START OF COMMERCIAL OPERATION<sup>1</sup>**

For compliance monitoring purposes, “commercial operation” is that phase of project development which begins after the completion of start-up and commissioning, where the power plant has reached steady-state production of electricity with reliability at the rated capacity. For example, at the start of commercial operation, plant control is usually transferred from the construction manager to the plant operations manager.

## **COMPLIANCE PROJECT MANAGER RESPONSIBILITIES**

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A Compliance Project Manager (CPM) will oversee the compliance monitoring and shall be responsible for:

1. ensuring that the design, construction, operation, and closure of the project facilities are in compliance with the terms and conditions of the Energy Commission Decision;
2. resolving complaints;
3. processing post-certification changes to the conditions of certification, project description, and ownership or operational control;
4. documenting and tracking compliance filings; and
5. ensuring that the compliance files are maintained and accessible.

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<sup>1</sup> A different definition of “Start of Commercial Operation,” may be included in the Air Quality (AQ) section (per District Rules or Federal Regulations). In that event, the definition included in the AQ section would only apply to that section.

The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies and the Energy Commission when handling disputes, complaints and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal required by a condition of certification requires CPM approval the approval will involve all appropriate staff and management.

The Energy Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the Energy Commission about power plant construction or operation-related questions, complaints or concerns.

## **PRE-CONSTRUCTION AND PRE-OPERATION COMPLIANCE MEETING**

The CPM may schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings will be to assemble both the Energy Commission's and the project owner's technical staff to review the status of all pre-construction or pre-operation requirements contained in the Energy Commission's conditions of certification to confirm that they have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings shall ensure, to the extent possible, that Energy Commission conditions will not delay the construction and operation of the plant due to oversight and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

## **ENERGY COMMISSION RECORD**

The Energy Commission shall maintain as a public record, in either the Compliance file or Docket file, for the life of the project (or other period as required):

- all documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
- all monthly and annual compliance reports filed by the project owner;
- all complaints of noncompliance filed with the Energy Commission; and
- all petitions for project or condition changes and the resulting staff or Energy Commission action.

## **PROJECT OWNER RESPONSIBILITIES**

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It is the responsibility of the project owner to ensure that the general compliance conditions and the conditions of certification are satisfied. The general compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, compliance conditions, or ownership. Failure to comply with any of the conditions of certification or the general compliance conditions may result in reopening of the case and revocation of Energy Commission certification, an administrative fine, or other action as appropriate. A

summary of the General Conditions of Certification is included as **Compliance Table 1** at the conclusion of this section. The designation after each of the following summaries of the General Compliance Conditions (**COM-1, COM-2, etc.**) refers to the specific General Compliance Condition contained in **Compliance Table 1**.

## **GENERAL CONDITIONS OF CERTIFICATION**

### **COM-1, Unrestricted Access**

The CPM, responsible Energy Commission staff, and delegate agencies or consultants, shall be guaranteed and granted unrestricted access to the power plant site, related facilities, project-related staff, and the files and records maintained on site, for the purpose of conducting audits, surveys, inspections, or general site visits. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time.

### **COM-2, Compliance Record**

The project owner shall maintain project files onsite, or at an alternative site approved by the CPM, for the life of the project unless a lesser period of time is specified by the conditions of certification. The files shall contain copies of all “as-built” drawings, all documents submitted as verification for conditions, and all other project-related documents.

### **COM-3, Compliance Verification Submittals**

Each condition of certification is followed by a means of verification. The verification describes the Energy Commission’s procedure(s) to ensure post-certification compliance with adopted conditions.

Verification of compliance with the conditions of certification can be accomplished by:

1. reporting on the work done and providing the pertinent documentation in monthly and/or annual compliance reports filed by the project owner or authorized agent as required by the specific conditions of certification;
2. providing appropriate letters from delegate agencies verifying compliance;
3. Energy Commission staff audits of project records; and/or
4. Energy Commission staff inspections of mitigation or other evidence of mitigation.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter subject line shall identify the involved condition(s) of certification by condition number and include a brief description of the subject of the submittal.** The project owner shall also identify those submittals **not** required by a condition of certification with a statement such as: “This submittal is for information only and is not required by a specific condition of certification.” When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal.



The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such condition was satisfied by work performed by the project owner or an agent of the project owner.

All submittals shall be addressed as follows:

**Donna Stone  
Compliance Project Manager  
California Energy Commission  
1516 Ninth Street (MS-2000)  
Sacramento, CA 95814**

If the project owner desires Energy Commission staff action by a specific date, they shall so state in their submittal and include a detailed explanation of the effects on the project if this date is not met.

### **COM-4, Pre-Construction Matrix and Tasks Prior to Start of Construction**

Prior to commencing construction a compliance matrix addressing only those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to the CPM. This matrix will be included with the project owner's **first** compliance submittal, and shall be submitted prior to the first pre-construction meeting, if one is held. It will be in the same format as the compliance matrix referenced below.

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Various lead times (e.g., 30, 60, 90 days) for submittal of compliance verification documents to the CPM for conditions of certification are established to allow sufficient staff time to review and comment and, if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

Failure to submit compliance documents within the specified lead-time may result in delays in authorization to commence various stages of project construction.

Verification lead times (e.g., 90, 60 and 30-days) associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification. It is important that the project owner understand that the submittal of compliance documents prior to project certification is at the owner's own risk. Any approval by Energy Commission staff is subject to change based upon the Final Decision.

## **EMPLOYEE ORIENTATION**

Environmental awareness orientation and training will be developed for presentation to new employees during project construction as approved by Energy Commission staff and described in the conditions for Biological, Cultural, and Paleontological resources. At the time this training is presented, the project owner's representative shall present information about the role of the Energy Commission's delegate Chief Building Official

(CBO) for the project. The role and responsibilities of the CBO to enforce relevant portions of the Energy Commission Decision, the CBSC, and other relevant building and health and safety requirements shall be briefly presented. As part of that presentation, new employees shall be advised of the CBO's authority to halt project construction activities, either partially or totally, or take other corrective measures, as appropriate, if the CBO deems that such action is required to ensure compliance with the Energy Commission Decision, the CBSC, and other relevant building and health and safety requirements. At least 30 days prior to construction, the project owner shall submit the proposed script containing this information for CPM review and approval.

## **COMPLIANCE REPORTING**

There are two different compliance reports that the project owner must submit to assist the CPM in tracking activities and monitoring compliance with the terms and conditions of the Commission Decision. During construction, the project owner or authorized agent will submit Monthly Compliance Reports. During operation, an Annual Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions of certification require that compliance submittals be submitted to the CPM in the monthly or annual compliance reports.

### **COM-5, Compliance Matrix**

A compliance matrix shall be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix is intended to provide the CPM with the current status of all compliance conditions in a spreadsheet format. The compliance matrix must identify:

1. the technical area;
2. the condition number;
3. a brief description of the verification action or submittal required by the condition;
4. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.);
5. the expected or actual submittal date;
6. the date a submittal or action was approved by the Chief Building Official (CBO), CPM, or delegate agency, if applicable;
7. the compliance status of each condition (e.g., "not started," "in progress" or "completed" (include the date); and
8. the project's preconstruction and construction milestones, including dates and status (if milestones are required).

Satisfied conditions do not need to be included in the compliance matrix after they have been identified as satisfied in at least one monthly or annual compliance report.

### **COM-6, Monthly Compliance Report**

The first Monthly Compliance Report is due one month following the Energy Commission business meeting date on which the project was approved, unless

otherwise agreed to by the CPM. The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the **Key Events List**. **The Key Events List form is found at the end of this section.**

During pre-construction and construction of the project, the project owner or authorized agent shall submit an original and five copies (or amount specified by Compliance Project Manager) of the Monthly Compliance Report within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain, at a minimum:

1. a summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
2. documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Monthly Compliance Report;
3. an initial, and thereafter updated, compliance matrix which shows the status of all conditions of certification;
4. a list of conditions that have been satisfied during the reporting period, and a description or reference to the actions which satisfied the condition;
5. a list of any submittal deadlines that were missed accompanied by an explanation and an estimate of when the information will be provided;
6. a cumulative listing of any approved changes to conditions of certification;
7. a listing of any filings with, or permits issued by, other governmental agencies during the month;
8. a projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification;
9. a listing of the month's additions to the on-site compliance file;
10. any requests, with justification, to dispose of items that are required to be maintained in the project owner's compliance file; and
11. a listing of complaints, notices of violation, official warnings, and citations received during the month, a description of the resolutions of any resolved complaints, and the status of any unresolved complaints.

### **COM-7, Annual Compliance Report**

After construction is complete, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. Annual Compliance Reports shall be submitted over the life of the project unless otherwise specified by the CPM.

Each Annual Compliance Report shall identify the reporting period and shall contain the following:

1. an updated compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
2. a summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
3. documents required by specific conditions to be submitted along with the Annual Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Annual Compliance Report;
4. a cumulative listing of all post-certification changes approved by the Energy Commission or cleared by the CPM;
5. an explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
6. a listing of filings made to, or permits issued by, other governmental agencies during the year;
7. a projection of project compliance activities scheduled during the next year;
8. a listing of the year's additions to the on-site compliance file;
9. an evaluation of the on-site contingency plan for unplanned facility closure, including any suggestions necessary for bringing the plan up to date [see General Conditions for Facility Closure addressed later in this section]; and
10. a listing of complaints, notices of violation, official warnings, and citations received during the year, a description of the resolution of any resolved complaints, and the status of any unresolved complaints.

### **COM-8, Construction and Operation Security Plan**

At least 14 days prior to commencing construction, a site-specific Security Plan for the construction phase shall be submitted to the CPM for approval. At least 30 days prior to the initial receipt of hazardous materials on-site, a site-specific Security Plan for the operational phase shall be submitted to the CPM for review and approval.

#### **Construction Security Plan**

The Construction Security Plan shall include the following:

1. site fencing enclosing the construction area;
2. use of security guards;
3. check-in procedure or tag system for construction personnel and visitors;
4. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and
5. evacuation procedures.

## **Operation Security Plan**

1. The Operations Security Plan shall include the following:
2. permanent site fencing and security gate;
3. evacuation procedures;
4. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency;
5. fire alarm monitoring system;
6. site personnel background checks, including employee and routine on-site contractors [Site personnel background checks are limited to ascertaining that the employee's claims of identity and employment history are accurate. All site personnel background checks shall be consistent with state and federal law regarding security and privacy.];
7. site access for vendors; and
8. requirements for Hazardous Materials vendors to prepare and implement security plans as per 49 CFR 172.800 and to ensure that all hazardous materials drivers are in compliance with personnel background security checks as per 49 CFR Part 1572, Subparts A and B.

In addition, the Security Plan shall include one or more of the following in order to ensure adequate perimeter security:

1. security guards;
2. security alarm for critical structures;
3. perimeter breach detectors and on-site motion detectors; and
4. video or still camera monitoring system.

The Project Owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to the Security Plan. The CPM may authorize modifications to these measures, or may recommend additional measures depending on circumstances unique to the facility, and in response to industry-related security concerns.

## **COM-9, Confidential Information**

Any information that the project owner deems confidential shall be submitted to the Energy Commission's Docket with an application for confidentiality pursuant to Title 20, California Code of Regulations, section 2505(a). Any information, that is determined to be confidential shall be kept confidential as provided for in Title 20, California Code of Regulations, section 2501 et. seq.

## **COM-10, Department of Fish and Game Filing Fee**

Pursuant to the provisions of Fish and Game Code Section 711.4, the project owner shall pay a filing fee in the amount of \$850. The payment instrument shall be provided to the Energy Commission's Project Manager (PM), not the CPM, at the time of project

certification and shall be made payable to the California Department of Fish and Game. The PM will submit the payment to the Office of Planning and Research at the time of filing of the notice of decision.

### **COM-11, Reporting of Complaints, Notices, and Citations**

Prior to the start of construction, the project owner must send a letter to property owners living within one mile of the project notifying them of a telephone number to contact project representatives with questions, complaints or concerns. If the telephone is not staffed 24 hours per day, it shall include automatic answering with date and time stamp recording. All recorded inquiries shall be responded to within 24 hours. The telephone number shall be posted at the project site and made easily visible to passersby during construction and operation. The telephone number shall be provided to the CPM who will post it on the Energy Commission's web page at:

[http://www.energy.ca.gov/sitingcases/power\\_plants\\_contacts.html](http://www.energy.ca.gov/sitingcases/power_plants_contacts.html)

Any changes to the telephone number shall be submitted immediately to the CPM who will update the web page.

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies of all complaint forms, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt, to the CPM. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the complaint form (Attachment A).

### **FACILITY CLOSURE**

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At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made that provide the flexibility to deal with the specific situation and project setting that exist at the time of closure. Laws, Ordinances, Regulations and Standards (LORS) pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure.

There are at least three circumstances in which a facility closure can take place, planned closure, unplanned temporary closure and unplanned permanent closure.

## **CLOSURE DEFINITIONS**

### **Planned Closure**

A planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

### **Unplanned Temporary Closure**

An unplanned temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster or an emergency.

### **Unplanned Permanent Closure**

An unplanned permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unplanned closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unplanned closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned.

## **GENERAL CONDITIONS FOR FACILITY CLOSURE**

### **COM-12, Planned Closure**

In order to ensure that a planned facility closure does not create adverse impacts, a closure process that provides for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least twelve months prior to commencement of closure activities (or other period of time agreed to by the CPM). The project owner shall file 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission.

The plan shall:

1. identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related remnants that will remain at the site;
2. identify a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;
3. identify any facilities or equipment intended to remain on site after closure, the reason, and any future use; and
4. address conformance of the plan with all applicable laws, ordinances, regulations, standards, local/regional plans in existence at the time of facility closure, and applicable conditions of certification.

In the event that there are significant issues associated with the proposed facility closure plan's approval, or the desires of local officials or interested parties are inconsistent with the plan, the CPM shall hold one or more workshops and/or the Energy Commission may hold public hearings as part of its approval procedure.

In addition, prior to submittal of the proposed facility closure plan, a meeting shall be held between the project owner and the Energy Commission CPM for the purpose of discussing the specific contents of the plan.

As necessary, prior to or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities, until Energy Commission approval of the facility closure plan is obtained.

### **COM-13, Unplanned Temporary Closure/On-Site Contingency Plan**

In order to ensure that public health and safety and the environment are protected in the event of an unplanned temporary facility closure, it is essential to have an on-site contingency plan in place. The on-site contingency plan will help to ensure that all necessary steps to mitigate public health and safety impacts and environmental impacts are taken in a timely manner.

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less than 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may require revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the on-site contingency plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

The on-site contingency plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days, unless other arrangements are agreed to by the CPM, the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment and the safe shutdown of all equipment. (Also see the analysis for the technical areas of Hazardous Materials Management and Waste Management.)

In addition, consistent with requirements under unplanned permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the on-site contingency plan. In addition, the status of the insurance coverage and major equipment warranties must be updated in the annual compliance reports.



In the event of an unplanned temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the circumstances and expected duration of the closure.

If the CPM determines that an unplanned temporary closure is likely to be permanent, or for a duration of more than twelve months, a closure plan consistent with the requirements for a planned closure shall be developed and submitted to the CPM within 90 days of the CPM's determination (or other period of time agreed to by the CPM).

#### **COM-14, Unplanned Permanent Closure/On-Site Contingency Plan**

The on-site contingency plan required for unplanned temporary closure shall also cover unplanned permanent facility closure. All of the requirements specified for unplanned temporary closure shall also apply to unplanned permanent closure.

In addition, the on-site contingency plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the unlikely event of abandonment.

In the event of an unplanned permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the status of all closure activities.

A closure plan, consistent with the requirements for a planned closure, shall be developed and submitted to the CPM within 90 days of the permanent closure or another period of time agreed to by the CPM.

### **CBO DELEGATION AND AGENCY COOPERATION**

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In performing construction monitoring of the project, Commission staff acts as, and has the authority of, the Chief Building Official (CBO). Commission staff may delegate CBO responsibility to either an independent third party contractor or the local building official. Commission staff retains CBO authority when selecting a delegate CBO including enforcing and interpreting state and local codes, and use of discretion, as necessary, in implementing the various codes and standards.

Commission staff may also seek the cooperation of state, regional and local agencies that have an interest in environmental control when conducting project monitoring.

### **ENFORCEMENT**

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The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Energy Commission Decision. The specific action and amount of any fines the Energy

Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of LORS, oversight, unforeseeable events, and other factors the Energy Commission may consider. Moreover, to ensure compliance with the terms and conditions of certification and applicable LORS, delegate agencies are authorized to take any action allowed by law in accordance with their statutory authority, regulations, and administrative procedures.

## **NONCOMPLIANCE COMPLAINT PROCEDURES**

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1230 et seq., but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure, as described in current State law and regulations, are described below. They shall be followed unless superseded by current law or regulations.

### **Informal Dispute Resolution Procedure**

The following procedure is designed to informally resolve disputes concerning the interpretation of compliance with the requirements of this compliance plan. The project owner, the Energy Commission, or any other party, including members of the public, may initiate this procedure for resolving a dispute. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents.

This procedure may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1230 et seq., but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The procedure encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be referred to the full Energy Commission for consideration via the complaint and investigation process. The procedure for informal dispute resolution is as follows:

#### **Request for Informal Investigation**

Any individual, group, or agency may request that the Energy Commission conduct an informal investigation of alleged noncompliance with the Energy Commission's terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation

is necessary, the project owner will be asked to promptly investigate the matter and, within seven working days of the CPM's request, provide a written report of the results of the investigation, including corrective measures proposed or undertaken, to the CPM. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to provide an initial report, within 48 hours, followed by a written report filed within seven days.

### **Request for Informal Meeting**

In the event that either the party requesting an investigation or the Energy Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within 14 days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

1. immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;
2. secure the attendance of appropriate Energy Commission staff and staff of any other agencies with expertise in the subject area of concern, as necessary;
3. conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner; and
4. after the conclusion of such a meeting, promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum which fairly and accurately identifies the positions of all parties and any conclusions reached. If an agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et seq.

### **Formal Dispute Resolution Procedure-Complaints and Investigations**

If either the project owner, Energy Commission staff, or the party requesting an investigation is not satisfied with the results of the informal dispute resolution process, such party may file a complaint or a request for an investigation with the Energy Commission's General Counsel. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1230 et seq.

The Chairman, upon receipt of a written request stating the basis of the dispute, may grant a hearing on the matter, consistent with the requirements of noticing provisions. The Energy Commission shall have the authority to consider all relevant facts involved and make any appropriate orders consistent with its jurisdiction (Cal. Code Regs., tit. 20, §§ 1232-1236).

## **POST CERTIFICATION CHANGES TO THE ENERGY COMMISSION DECISION: AMENDMENTS, OWNERSHIP CHANGES, INSIGNIFICANT PROJECT CHANGES AND VERIFICATION CHANGES**

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The project owner must petition the Energy Commission pursuant to Title 20, California Code of Regulations, section 1769, in order to modify project design, operation or performance requirements, and to transfer ownership or operational control of the facility. It is the responsibility of the project owner to contact the CPM to determine if a proposed project change should be considered a project modification pursuant to section 1769. Implementation of a project modification without first securing Energy Commission or Energy Commission staff approval may result in enforcement action that could result in civil penalties in accordance with section 25534 of the Public Resources Code.

A petition is required for **amendments** and for **insignificant project changes** as specified below. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to the CPM, who will file it with the Energy Commission's Docket in accordance with Title 20, California Code of Regulations, section 1209.

The criteria that determine which type of approval and the process that applies are explained below.

### **AMENDMENT**

The project owner shall petition the energy commission, pursuant to Title 20, California Code of Regulations, Section 1769, when proposing modifications to project design, operation, or performance requirements. If a proposed modification results in deletion or change of a condition of certification, or makes changes that would cause the project not to comply with any applicable laws, ordinances, regulations or standards, the petition will be processed as a formal amendment to the final decision, which requires public notice and review of the Energy Commission staff analysis, and approval by the full commission. This process takes approximately two to three months to complete, and possibly longer for complex project modifications.

### **CHANGE OF OWNERSHIP**

Change of ownership or operational control also requires that the project owner file a petition pursuant to section 1769 (b). This process takes approximately one month to complete, and requires public notice and approval by the full commission.

### **INSIGNIFICANT PROJECT CHANGE**

Modifications that do not result in deletions or changes to conditions of certification, and that are compliant with laws, ordinances, regulations and standards may be authorized by the CPM as an insignificant project change pursuant to section 1769(a) (2). This process usually takes less than one month to complete, and it requires a 14-day public review of the Notice of Insignificant Project Change that includes staff's intention to approve the modification unless substantive objections are filed.

## **VERIFICATION CHANGE**

A verification may be modified by the CPM without requesting an amendment to the decision if the change does not conflict with the conditions of certification and provides an effective alternate means of verification. This process usually takes less than five working days to complete.

## COM-6, KEY EVENTS LIST

PROJECT: \_\_\_\_\_

DOCKET # \_\_\_\_\_

COMPLIANCE PROJECT MANAGER: \_\_\_\_\_

### EVENT DESCRIPTION

### DATE

Certification Date/Obtain Site Control	
Online Date	
<b>POWER PLANT SITE ACTIVITIES</b>	
Start Site Mobilization	
Start Ground Disturbance	
Start Grading	
Start Construction	
Begin Pouring Major Foundation Concrete	
Begin Installation of Major Equipment	
Completion of Installation of Major Equipment	
First Combustion of Gas Turbine	
Start Commercial Operation	
Complete All Construction	
<b>TRANSMISSION LINE ACTIVITIES</b>	
Start T/L Construction	
SYNCHRONIZATION WITH GRID AND INTERCONNECTION	
COMPLETE T/L CONSTRUCTION	
<b>FUEL SUPPLY LINE ACTIVITIES</b>	
Start Gas Pipeline Construction and Interconnection	
COMPLETE GAS PIPELINE CONSTRUCTION	
<b>WATER SUPPLY LINE ACTIVITIES</b>	
START WATER SUPPLY LINE CONSTRUCTION	
COMPLETE WATER SUPPLY LINE CONSTRUCTION	

**TABLE 1**  
**COMPLIANCE SECTION**  
**SUMMARY of GENERAL CONDITIONS OF CERTIFICATION**

<b>CONDITION NUMBER</b>	<b>PAGE #</b>	<b>SUBJECT</b>	<b>DESCRIPTION</b>
COM-1	4	Unrestricted Access	The project owner shall grant Energy Commission staff and delegate agencies or consultants unrestricted access to the power plant site.
COM-2	4	Compliance Record	The project owner shall maintain project files on-site. Energy Commission staff and delegate agencies shall be given unrestricted access to the files.
COM-3	4	Compliance Verification Submittals	The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether the condition was satisfied by work performed by the project owner or his agent.
COM-4	5	Pre-construction Matrix and Tasks Prior to Start of Construction	Construction shall not commence until all of the following activities/submittals have been completed: <ul style="list-style-type: none"> <li>▪ property owners living within one mile of the project have been notified of a telephone number to contact for questions, complaints or concerns;</li> <li>▪ a pre-construction matrix has been submitted identifying only those conditions that must be fulfilled before the start of construction;</li> <li>▪ all pre-construction conditions have been complied with; and</li> <li>▪ the CPM has issued a letter to the project owner authorizing construction.</li> </ul>
COM-5	6	Compliance Matrix	The project owner shall submit a compliance matrix (in a spreadsheet format) with each monthly and annual compliance report which includes the status of all compliance conditions of certification.
COM-6	6	Monthly Compliance Report (including a Key Events List)	During construction, the project owner shall submit Monthly Compliance Reports (MCRs) which include specific information. The first MCR is due the month following the Commission business meeting date on which the project was approved and shall include an initial list of dates for each of the events identified on the Key Events List.

<b>CONDITION NUMBER</b>	<b>PAGE #</b>	<b>SUBJECT</b>	<b>DESCRIPTION</b>
COM-7	7	Annual Compliance Reports	After construction ends and throughout the life of the project, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports.
COM-8	8	Security Plans	Thirty days prior to commencing construction, the project owner shall submit a Security Plan for the construction phase. Sixty days prior to initial receipt of hazardous material on site, the project owner shall submit an Security Plan & Vulnerability Assessment for the operational phase.
COM-9	9	Confidential Information	Any information the project owner deems confidential shall be submitted to the Dockets Unit with an application for confidentiality.
COM-10	9	Dept of Fish and Game Filing Fee	The project owner shall pay a filing fee of \$850 at the time of project certification.
COM-11	9	Reporting of Complaints, Notices and Citations	Within 10 days of receipt, the project owner shall report to the CPM, all notices, complaints, and citations.
COM-12	10	Planned Facility Closure	The project owner shall submit a closure plan to the CPM at least twelve months prior to commencement of a planned closure.
COM-13	11	Unplanned Temporary Facility Closure	To ensure that public health and safety and the environment are protected in the event of an unplanned temporary closure, the project owner shall submit an on-site contingency plan no less than 60 days prior to commencement of commercial operation.
COM-14	12	Unplanned Permanent Facility Closure	To ensure that public health and safety and the environment are protected in the event of an unplanned permanent closure, the project owner shall submit an on-site contingency plan no less than 60 days prior to commencement of commercial operation.



### COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME: AFC Number:
<b>COMPLAINT LOG NUMBER</b> _____ Complainant's name and address:   Phone number:
Date and time complaint received: Indicate if by telephone or in writing (attach copy if written): Date of first occurrence:
Description of complaint (including dates, frequency, and duration):    
Findings of investigation by plant personnel:    Indicate if complaint relates to violation of Energy Commission requirement: Date complainant contacted to discuss findings:
Description of corrective measures taken or other complaint resolution:       Indicate if complainant agrees with proposed resolution: If not, explain:   Other relevant information:
If corrective action necessary, date completed: Date first letter sent to complainant: _____ (copy attached) Date final letter sent to complainant: _____ (copy attached)
This information is certified to be correct. Plant Manager's Signature: _____ Date: _____

(Attach additional pages and supporting documentation, as required.)

# ROSEVILLE ENERGY PARK PREPARATION TEAM

Executive Summary .....	Bob Eller
Introduction .....	Bob Eller
Project Description .....	Bob Eller
Air Quality.....	Joe Loyer
Biological Resources.....	Stuart Itoga
Cultural Resources.....	Gary Reinoehl
Hazardous Materials .....	Geoff Lesh, P.E. and Rick Tyler
Land Use.....	David Flores
Noise and Vibration.....	Shahab Khoshmashrab, Kevin Robinson and Steve Baker
Public Health .....	Obed. Odoemelam, Ph.D.
Socioeconomics .....	Joseph Diamond, Ph.D.
Soil and Water.....	Richard Latteri
Traffic and Transportation .....	James Adams and Eileen Allen
Transmission Line Safety and Nuisance .....	Obed Odoemelam, Ph.D.
Visual Resources .....	Eric Knight
Waste Management .....	Ellie Townsend-Hough
Worker Safety and Fire Protection .....	Geoff Lesh, P.E. and Rick Tyler
Facility Design.....	Kevin Robinson, Al McCuen and Steve Baker
Geology and Paleontology .....	Patrick Pilling, Ph.D.
Power Plant Efficiency.....	Shahab Khoshmashrab
Power Plant Reliability.....	Shahab Khoshmashrab
Transmission System Engineering.....	Laiping Ng and Al McCuen
Alternatives .....	Bob Eller

Compliance Monitoring and Facility Closure ..... Donna Stone  
Project Assistant ..... Keith A. Muntz  
Support Staff ..... Evelyn Johnson